

ASSESSING AND OPTIMIZING PATIENT-PROVIDER COMMUNICATION
REGARDING CARDIOVASCULAR REHABILITATION (VRCOMM)

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Abstract

Cardiovascular rehabilitation (CR) is proven to reduce morbidity and mortality in cardiac patients. Despite the evidence of benefit, only 15-20% of patients participate. The most successful strategy to promote CR utilization is systematic referral through healthcare provider (HCP) discussions with the patients. The objectives of this study were to: (1) describe patient-HCP interaction regarding CR at the bedside, and (2) investigate which elements were related to patient referral and enrollment.

This was a prospective study of cardiovascular patients (n=58) and their HCPs (n=60) who received, a digital audiorecorder to record their subsequent interaction, about “secondary prevention”. All HCP and patient participants completed a self-report survey assessing sociodemographic characteristics, perceptions of CR and their clinical interaction. Fifty patient- HCP interactions were successfully digitally recorded and coded using the Roter Interaction Analysis System, a method of coding medical dialogue.

The results show that, CR referral- making following a cardiovascular event was not allocated to a specific HCP; therefore HCP awareness of patient’s referral was incredibly low. Some elements of patient-HCP communication were significantly related to patient referral and enrollment in CR programs weeks later. These elements were: greater HCP interactivity, less patient concern and worry, less HCP reassurance and optimism, and more time allocated to patient questions related to lifestyle. Further tests is needed to examine whether HCPs can be trained to communicate with cardiovascular patients in a manner that enhances CR enrollment rates.

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Introduction

Globally, cardiovascular disease (CVD) is the leading cause of mortality, with 17.3 million deaths each year. (1) Heart disease and stroke are two of the leading causes of death in Canada (2,3) and are associated with frequent readmissions, physician services, hospital costs, and decreased productivity. In 2008, CVD accounted for 29% of all deaths in Canada and three major causes were, ischemic heart disease (54%), stroke (20%), and heart attack (23%). (2,4) In Canada, the prevalence and death rates of coronary heart disease differ among various ethnic groups, with the highest rates being among those of European and South Asian (5) origin, but lowest among those of Chinese origin. (6,7) In fact, there was a greater rate of clinical events among South Asians compared to those of European and Chinese origin for similar degrees of atherosclerosis, suggesting that the propensity to plaque rupture may vary in different ethnic groups. (7)

Despite advances in treatment and secondary prevention, a large number of Canadians continue to live with CVD. (8) Secondary prevention measures, such as cardiovascular rehabilitation (CR), can effectively reduce this burden. (9,10) The Canadian Association of Cardiac Rehabilitation has defined secondary prevention as, “the sum total of all interventions, both physiological and behavioural, designed to favorably modify an individual’s lifestyle, enhance adherence and reinforce compliance with long-term behaviors compatible with minimizing disease progression”. (11) CR is offered through multidisciplinary outpatient programs, which focus on improving and maintaining cardiovascular health through, exercise, education, and counseling. CR has

been shown to reduce readmission rates by about 25%–30% and to have favorable effects on patients' quality of life. (12) However, despite the evidence of CR benefit (13) and clinical guidelines recommending CR referral for eligible patients (14), only 15-30% of patients with coronary artery disease (CAD) access CR. (15)

Referral to CR is considered best practice, with most successful strategy to promote CR utilization being systematic referral augmented with a patient-healthcare provider (HCP) discussion at the time of discharge following a relevant cardiac event. (16) Reasons for the gap in CR participation are numerous, but studies show that HCP encouragement is related to a two-times greater CR enrollment. (17,18) The primary objective of this observational prospective study is to describe and improve patient-HCP discussions regarding CR and to identify elements of the patient-HCP interaction that influence CR referral and enrollment.

Review of Literature

Cardiovascular Diseases

CVD refers to a group of disorders involving the heart, the blood vessels of the heart and the system of blood vessels (veins and arteries) throughout the body and within the brain. (3) CVD is the leading cause of mortality and morbidity worldwide. (2,19) In Canada, the primary cause of hospitalization continues to be coronary artery disease (CAD) and cerebrovascular disease or stroke. CVD accounts for 16.9% of total hospitalization, with 19.8% of these hospitalizations for men and 14.0% for women. (3) CAD and stroke have become a burden on the Canadian economy, with a total direct cost

(i.e., hospital care, physician services, and other institutional care) of \$20.9 billion every year. (19)

Coronary artery disease (CAD), also known as ischemic heart disease, is the major contributor to cardiovascular death. (1) CAD is a disease of the blood vessels supplying oxygen-rich blood to the heart muscle. Stroke is one of the leading causes of death in Canada, with increased prevalence of death in women each year. (2,3) Strokes are a group of conditions that develop as a result of problems with the blood vessels supplying the brain, causing cell death and permanent damage. (20) About 80% of strokes are ischemic (i.e., caused by an interruption of blood flow to the brain due to a blood clot), and 20% of strokes are hemorrhagic (i.e., caused by uncontrolled bleeding in the brain). By conventional clinical definitions, if neurological symptoms continue for more than 24 hours, a person has been diagnosed with stroke; otherwise, a focal neurological deficit lasting less than 24 hours has been defined as a transient ischemic attack (TIA). (21,22) After having a TIA, there is a 90-day risk of a stroke reported as high as 10.5%, with the greatest stroke risk apparent in the first week. (21)

Individuals who suffer from a TIA or mild, non-disabling stroke often have comorbid CVD. CAD and stroke share many similar modifiable risk factors including physical inactivity, obesity, high blood pressure, high blood cholesterol, diabetes, smoking, and alcohol consumption. Studies have demonstrated that due to similar secondary prevention guidelines as CVD, 80% of a recurrent vascular event after the first TIA or stroke can be prevented with an exercise-based, lifestyle intervention in

combination with pharmaceutical drugs. (23,24) Secondary prevention, such as CR, requires a multifactorial approach. Lennon et al. (25) demonstrated that patients who sustained a prior stroke 1-12 years ago improved their risk factors and psychological status after attending a 10-week comprehensive CR program. Recent evidence has shown the efficacy and feasibility of CR following a stroke. (4,23,26,27)

Much progress has been made in understanding the pathogenesis of CVD, and the development of clinical care and treatment. (28) Current treatments include: pharmaceutical drugs, revascularization procedures, and chronic disease management programs. Advances in treatment and secondary prevention have resulted in a large prevalence of Canadians living with CVD.(8) However, interventional procedures are palliative, and they do not treat underlying atherosclerosis and endothelial dysfunction. Similar enthusiasm which have been adopted for pharmaceutical drugs and surgical procedures has not yet been paralleled for secondary prevention of CAD, even though modification of risk factors and lifestyle changes have been shown to reduce the risk of another CAD event, and more importantly to stop or delay the progress of coronary atherosclerosis. (28)

Cardiovascular Rehabilitation

The Canadian Association of Cardiac Rehabilitation defines CR as, “the enhancement and maintenance of cardiovascular health through individualized programs designed to optimize physical, psychological, social, vocation and emotional status”. (8) CR offers a systematic process of individualized care for CVD patients. (29) CR is a

chronic disease management program, providing interprofessional care by medical, nursing, exercise physiology/ kinesiology, pharmacy and psychosocial practitioners as well as registered dietitians. (14) CR participants undergo comprehensive medical assessment, receive an individually-tailored exercise prescription, partake in supervised exercise, and participate in education and counseling, all of which is summarized and shared with the patient and other HCPs involved in the patients care. (11) Physical activity is the core component of CR. (29,30) CR programs differ in duration, but in Ontario, the average CR program is 5-6 months in duration, and supervised exercise sessions are offered to patients twice per week. (31) It is well established that the quality and longevity are significantly improved following participation in CR. (32–38) There is substantial evidence to conclude that CR is necessary for cardiac patients, and more recently CR has shown to be feasible after a stroke and adaptable to accommodate for those with a range of post-stroke disability. (26)

In the most recent Cochrane review, reduced hospital readmission rates were observed in the 6-12 months following CR when compared to patients not participating, and significantly reduced mortality was observed beyond 12 months post CR. (39) Other benefits of CR include increased functional capacity, improved psychosocial well-being, greater smoking cessation, improved blood lipid profile, and reduced hypertension. (40–42) Similarly, over half of the studies reviewed by Clark et al. (43) found secondary prevention programs positively affected cardiovascular risk factor reduction and improved the quality of life in patients with coronary artery disease who participated in an intervention program.

While medical management and interventions can be successful, patient lifestyle changes and participation in an exercise program are a crucial part of secondary prevention. Participation in CR can decrease the burden of re-hospitalizations and procedures. (44) Based on this evidence, CR is a Class I, level A recommendation in the clinical practice guidelines (14,29,30) and referral to CR has been recommended as standard of care. (37)

Use of CR

Despite the evidence of benefit in multiple domains and these clinical recommendations, CR is significantly under-utilized. The reasons for the disparity between evidence and care are complex but, arguably, the two chief are: physician referral failure and lack of HCP endorsement. (15,45–47) Specifically, only 15-30% of Canadians access CR. (15) This under-utilization is an international problem, with similar low participation (43) and poor referral rates found in the United States, Europe, and Australia. For instance, the EUROSPIRE III survey in Europe reported that of the 44.8% of patients with coronary heart disease advised to attend a CR program, only 81.4% did so. (44) However, the process of moving patients through the cardiovascular care system from acute care to CR involves the HCPs, but moreover action by patients; the referred patient must attend an intake assessment and ultimately participate in the program.

Despite the ever-growing evidence demonstrating its benefits, the reason for the lack of CR utilization is multi-factorial. Many barriers have been identified systematically and comprehensively at the patient, HCP, CR program and health system

level (**Figure 2**). (49) Patient level barriers include: older age, female gender, non-white/Caucasian ethno- racial descent, lower of educational attainment, low socioeconomic status, lack of transportation, distance to the facility, occupation, family composition, social support, weather, co-morbid conditions, psychosocial issues and low motivation.(49–52) HCP level barriers include: physician specialty (i.e., cardiologists are more likely to refer to CR), lack of referral, lack of awareness of CR, and referral bias based on the patients' perceived motivation, ability and/or willingness to participate in CR. (53) CR program level barriers include: scheduling inconvenience (i.e., timing of classes interferes with role responsibilities), patient preferences (i.e., exercising in a group setting), lack of sufficient time (i.e., patients discouraged by long waiting times to enroll in the program), inadequate facilities, alternative CR models such as home-based programs, and health insurance coverage. Health systems level barriers include: lack of funding (i.e., budget cuts), lack of capacity, no standardized referral strategy, physician incentives and lack of institutional support for chronic or preventative care programs.

Current research focused on initiating secondary prevention programs have included strategies that target improvements in hospital procedures before eligible patients are discharged. Systematic referral strategies have emerged to improve referral and enrollment rates to CR. As demonstrated through a systematic review,(16) meta-analysis undertaken to inform a GRADE (54) based policy position, (55) and prospective cohort study, (56) systematic referral strategies significantly increase CR referral and utilization, up to approximately 85% and 70% respectively. With regard to the latter, the most successful strategy was found to be a combination of a systematic referral (i.e.,

electronic patient record, or standardized discharge order/checklist) and by patient-HCP discussion at the bedside. The American Heart Association launched the 'Get with the Guidelines' program to close the treatment gap and increase referral over time.(16) These successful strategies have been developed to prompt or remind HCPs to make a referral prior to discharge, but previous research has shown that patient-HCP communication is central to patient enrollment. However, there is little understanding of HCP discussions with patients and how these might be optimized to address patient barriers and maximize patient CR enrollment rates. Also, it has been demonstrated that the use of patient engagement tools (e.g., patient motivational letters) at the bedside discussion can increase the rates of CR enrollment up to of 70%. However, these tools have been scantily investigated. (13)

The American Association of Cardiovascular and Pulmonary Rehabilitation, American College of Cardiology, American Heart Association Cardiac Rehabilitation, and Secondary Prevention Performance Measure committee, have created performance measures to identify and correct gaps in care, promote referrals of all eligible patients into a CR program, and deliver high quality services through a multidisciplinary CR program. (14) It is unknown whether these performance measures are acceptable to HCPs, and indeed promote patient referral to and enrollment CR programs. On average, only 10%-30% of eligible patients participating in CR. Ranges vary between 11% and 38% depending on the area of the country. The reasons for these low enrollment rates are multi-factorial. (57) In an effort to overcome these barriers, numerous strategies have

been developed and systematic referral shows promise in increasing CR referral and enrollment. (12)

Another finding associated with CR initiation and participation, other than gender and disease severity, is HCP endorsement. (18) Patients who perceived greater HCP endorsement were two- times more likely to enroll in CR and attend a greater percentage of CR sessions. As well, those who discussed CR with their family doctors, cardiologists, or cardiac surgeons reported significantly greater endorsement than those discussing CR with nurses.(18) Similarly, Ades et al., (45) found that only 1.8% of patients enrolled into CR when the patient perceived the physicians recommendation to be, “not mentioned to moderately supportive” compared to a 66% enrollment rate with a strong physician recommendation. Indeed, one of the strongest factors associated with CR initiation and participation is physician recommendation.(45,58) In addition to the physician, nurses play an integral role as a core member of the patient’s healthcare team. Nurses recommendation, though not as effective, are able to promote CR awareness and participation to a higher degree as they spend much more time with patients on the inpatient units, having influence over the patient’s decision making process, and able to prepare the referral documentation in advance for the physician to sign. (58)

Healthcare Communication

Communication is the means by which information is delivered among individuals. Health communication is defined as, “the art and technique of informing, influencing, and motivating individual, institutional, and public audiences about important health issues. The scope of health communication includes disease prevention,

health promotion, health care policy, and the business of health care as the enhancement of the quality of life and health of individuals within the community”. (59) The theory behind this communication outlines, “an area of research and practice related to understanding and influencing the interdependence of communication (symbolic interaction in the forms of messages and meanings) and health related beliefs, behaviors and outcomes.” (60) Effective communication enables HCPs (e.g., physicians, nurse-practitioners, nurses, pharmacists, dieticians, or community liaisons) to provide relevant health information that educates their patients about significant threats and strategies to improve health outcomes.

For successful patient transition across the continuum of care, effective communication between the HCP and the patient is essential. Kripalani et al., (53) used data from observational studies to assess the lack of communication and information transfer between hospital-based and primary care physician at hospital discharge. Direct communication between hospital physicians and primary care physicians occurred infrequently (3%-20%), and the availability of a discharge summary at the first post-discharge visit was low (12%-34%) and remained poor at 4 weeks (51%-77%). (61) The quality of care was affected in approximately 25% of follow-up visits, contributing to dissatisfaction of primary care physician. Other deficits included: lack of information in discharge summaries about discharge medication, pending test results, patient or family counseling, and consequent follow-up plans, all of which adversely affect patient care. (61) In July 2007, the American College of Physicians, Society of Hospital Medicine, and Society of General Internal Medicine convened a multi-stakeholder consensus conference

to address the quality gaps in the transitions between inpatient and outpatient settings and to develop standards for these transitions. (62) Five principles of effective care transition were developed: (1) accountability; (2) clear and direct communication of treatment plans and follow-up expectations; (3) timely feed-forward of information; (4) involvement of the patient and family members unless inappropriate; and (5) respect of the coordination of care. (62) Maintaining the continuity of care is important in improving patient outcomes and self-management, all while reducing the cost of care.

Effective healthcare communication practices are vital to patient-centered quality of care. Patient-centered communication is defined as, “the array of communicative behaviors that can enhance the quality of the relationship between the HCP and patient, or the patients family”. (63) Much of the research in this field has focused on patient-HCP exchange during face-to-face clinic visits. However, advanced telecommunication devices such as videophone, telephone, and email have been used more recently for health care communication. (64) Preliminary research suggests that the mode of communication is related to differences in patient-HCP communication patterns. Wakefield et al. (56) assessed the difference in communication between telephone and videophone visits between nurses and patients following discharge for treatment of heart failure. They reported that nurses were more prone to use open-ended questions, back-channel responses, make friendly jokes, and check for understanding on the telephone when compared to videophone. Furthermore, patients were more likely to give lifestyle information and approval comments on the telephone, and used more closed-ended questions on the videophone. (57)

The Roter interaction analysis system (RIAS) is a method of coding medical dialogue, and has been used within various countries and healthcare settings. This system of analysis is a useful tool for facilitating the understanding of the dialogue exchange between patients and HCPs. The application of this tool has been shown to be both reliable and valid. (66) It has been validated in several countries and healthcare settings (66), including in cardiac surgery patients. RIAS is able to monitor content-specific information, especially related to medical dialogue, through the use of an audiorecorder. Coders are able to indicate the specific elements or criteria they would like to evaluate during a patient- HCP conversation, such as empathy and interactivity. Sonntag et al. (67) analyzed audio-taped encounters between general practitioners and their overweight and obese patients. They reported that an increased body mass index was found to be associated with longer discussions with patients and their general practitioners ($p=0.01$). Statements regarding cardiovascular risk were most frequent, followed by nutrition counseling, and physical activity. The subject of discussion in these encounters was primarily determined by the sex of the patient and of the general practitioners. (67) For instance, the frequency of statements regarding cardiovascular utterances was significantly greater in male practitioners with male patients rather than with female patients. (67)

Patient-centered communication is essential to achieve optimal health outcomes at which the patient adheres to treatment and express long-term satisfaction. Studies have demonstrated that patients belonging to ethnic minority groups experience lower levels of patient- centered communication. (68,69) In a cohort study, Johnson et al. (69), examined

the patient race/ethnicity and quality of patient-physician communication during medical visits. Physicians were 23% more verbally dominant and 33% less patient-centered with African American than with Caucasian patients. Weert et al., (70) reported a lack of patient-centered communication along with overlap and gaps in conversations during videotaped preoperative consultations of 51 cardiac surgery patients with their health care HCPs (i.e., physicians, nurses and health educators). Psychosocial questions and 'long-term' questions about life after discharge were barely raised. However, physicians spent more time on collecting information (4.3 min; 40.9% of physician's verbal contribution consisted of questions), while health care educators mostly provided information (9.4 min; 95.6% of their verbal contribution). The nurses on the other hand, were both educating and questioning the patient: 12.9 min (75.6%) of the nurses verbal contribution was spent on education, 2.8 min (16.7%) on posing questions and 1.3 min (7.7%) on other social communication. (70) Physicians and nurses similarly spent one-third of the time (29.8%) on medical issues.(70) Certain subtle aspects of patient- HCP communication, such as emotional tone and perceived listening, are also important in effective clinical practice.(63) Further, discussions of patients with their HCPs should be accurate and comprehensive. This is particularly relevant for CVD patients to support their transition of care from acute care hospital settings to chronic disease management programs, such as CR services.

Aims and Objectives

Rationale

This is the first exploratory feasibility study to our knowledge to examine and quantify the nature of the patient-HCP communication in relation to CR referral and enrollment. The focus on patients with TIA or mild, non-disabling stroke, and comparison across several different types of HCPs is novel. The primary objectives of this thesis were to: (1) understand discussions between patients and HCPs regarding CR, and (2) identify elements of the patient-HCP interaction that distinguish patients referred to and enrolled in CR program versus from those who were not.

The secondary objective was to compare elements of patient-HCP communication regarding CR under “usual”/control conditions, versus patient-HCP communication which is facilitated by the following tools: (a) a CR program pamphlet (Appendix F); and a motivational letter signed by the medical director of the CR program from the same institution (Appendix G); (b) a comprehensive patient discharge contract including CR (Appendix I); and (c) a telephone script when calling patients at home (Appendix I).

Objectives

1. To assess and code patient-HCP discussions regarding CR in accordance with the Roter Interaction Analysis System(66) as well as additional study-specific elements.
2. Compare elements of patient-HCP interaction regarding CR by patient sociodemographic (i.e., sex, age, work status, socioeconomic status) and clinical (i.e., index cardiovascular condition, cardiovascular history, disease severity, and

depressive symptoms) characteristics, as well as other factors to be assessed after the interaction (e.g., perceived HCP endorsement of CR, awareness of CR, and previous referral or enrollment in CR).

3. To relate elements of the patient-HCP interaction to degree of patient CR referral and enrollment.
4. To compare patient-HCP communication regarding CR by type of HCP (i.e., nursing, allied health, physician or peer mentor) and discussion with previous CR graduates working through Volunteer Services.

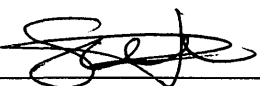
Manuscript Preface

The objectives of this thesis were to: (1) investigate patient-HCP discussions regarding CR from multiple perspectives (i.e., patient, HCP, and researcher); (2) describe the concordance between HCP perceptions of patient's CR referral with CR referral reported in patients' chart; and (3) identify elements of the patient-HCP interaction which distinguished between patients who were referred to CR versus those who were not. Participants were recruited from the cardiovascular units and at the Stroke Prevention Clinic from three hospitals. Upon consent (Appendix A, B, and C) a digital audiorecorder was provided to record patient- HCP subsequent interaction, about "secondary prevention". All HCP and patient participants completed a self-report survey assessing sociodemographic characteristics, perceptions of CR (Appendix E, J, and L) and their clinical interaction (Appendix D). Discussions were anonymized and coded using the Roter Interaction Analysis System, a method of coding medical dialogue (Appendix M). Two months later, CR referral (yes/no) was extracted from CR charts and/or self-report. Analytic techniques included descriptive statistics and logistic regression used to examine which utterances significantly related at the bivariate level, were associated with CR referral. The results of this study are presented in the manuscript which follows.

Certificate of Authentication

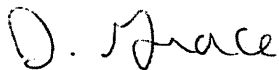
Re: Elements of Patient- Healthcare Provider Communication Related to Cardiovascular Rehabilitation Referral

I hereby confirm that the first author of this manuscript and study coordinator, Sanam Pourhabib, was responsible for recruiting patients and providers from Mackenzie Health, data entry and cleaning since initiating her Master's degree, and the statistical analysis, and write-up of the first iteration of the manuscript. As well, she was responsible for maintaining ethics approvals and communication with REBs, maintaining the study binder, completing case report forms (CRFs), managing the participant database in MS Excel, data entry into statistical software SPSS, content-specific coding of audiorecordings, and ascertainment of CR referral and enrollment at CR sites, in accordance with the task delegation log. The co-authors are co-investigators who provided editorial feedback prior to submission.

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ELEMENTS OF PATIENT-HEALTHCARE PROVIDER COMMUNICATION
RELATED TO CARDIOVASCULAR REHABILITATION REFERRAL

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Abstract

Objective: To describe (1) patient-healthcare provider (HCP) interactions regarding cardiovascular rehabilitation (CR), (2) the concordance between HCP perceptions of patient referral and CR chart-reported referral, and (3) which discussion elements were related to patient referral.

Methods: This was a prospective study of cardiovascular patients and their HCPs recruited from three hospitals. A digital audiorecorder was provided to record a subsequent interaction about “secondary prevention”. Participants completed a self-report survey assessing perceptions of CR and their clinical interaction. Discussion utterances were coded using the Roter Interaction Analysis System. Two months later, CR referral was ascertained.

Results: Discussion between 26 HCPs and 50 patients were recorded (response rate=70.7%). The predominant elements of the discussion were HCPs giving information about therapy (mean±SD 38.38±36.97 utterances/discussion), followed by patients showing understanding and agreement (33.20±29.44). Overall, 35 (70%) patients were referred to CR, and HCPs correctly perceived referral status for 10% of patients ($\kappa=0.095$). CR referral was related to greater HCP interactivity (Odds ratio [OR] =2.82, 95% CI 1.01-7.86), and less patient concern and worry (OR=0.64, 95% CI 0.45-0.89).

Conclusion/ Practice Implication: HCPs were often unaware of whether their patients were ultimately referred to CR, however taking the time for reciprocal discussion and allaying patient anxiety could promote greater referral.

1. Introduction

Cardiovascular disease, including coronary artery disease (CAD) and stroke, are among the leading causes of morbidity and mortality globally. (1) CAD and transient ischemic attack or mild, non-disabling stroke have similar atherosclerotic etiology and modifiable risk factors. As such, similar to secondary prevention for CAD, recurrent vascular events in stroke patients can be prevented with an exercise-based, lifestyle intervention in combination with medication therapies.(2,3)

Comprehensive chronic disease management programs, such as cardiovascular rehabilitation (CR), play an integral role in augmenting recovery. CR involves structured exercise training, education, risk factor reduction and behavior change counseling. Participation in CR programs have been shown to reduce mortality by about 25%–30% and to have favorable effects on re-hospitalization and functional capacity. (4) Emerging evidence supports the feasibility, safety and benefits of CR for transient ischemic attack/mild non-disabling stroke patients as well. (2,5,6)

However, despite the evidence of CR benefit (7) in multiple domains and clinical guideline recommendations to refer patients, (8) only 15-30% of CAD patients access CR(9). Referral to CR, involving form completion and submission by a healthcare provider (HCP), is required to initiate patient access. The patient should be informed that the referral is being submitted, and to expect a phone call at home from the program in the week or so post-discharge. However, to date, the verbal and non-verbal aspects of these discussions have not been characterized, and thus it is unknown how the nature of

these discussions may influence patient referral. Accordingly, the objectives of this study were to: (1) describe patient-HCP discussions regarding CR from multiple perspectives (i.e., patient, HCP, and researcher); (2) describe the concordance between HCP perceptions of patient referral with CR chart-reported referral; and (3) identify elements of the patient-HCP interaction which distinguish patients referred to CR versus those who were not.

2. Methods

2.1 Design and procedure

This was an observational, prospective study of cardiovascular patients and their HCPs recruited between September 2011 to November 2012 from three hospitals (two academic) in Southern Ontario. Ethics approval was granted by all participating organizations' research ethics boards. A diagram depicting study flow is shown in **Figure 1**.

All HCPs on the cardiovascular units and at the Stroke Prevention Clinic were approached via email and in-services to solicit informed consent to participate. Upon HCP consent, cardiovascular patients were approached to participate in the study on the days the HCP was working, until an interaction was audiorecorded. Willing HCPs and/or patients were asked to carry a numbered digital recorder throughout the day, and to turn it on and off at the beginning and end of their interaction, respectively.

After the patient-HCP dialogue had been recorded, patients were asked to complete a self-report survey. It assessed sociodemographic characteristics, as well as

attitudes and perceptions towards their HCP and their CR conversation. Clinical characteristics were extracted from patient charts. The participating HCPs were similarly asked to complete a self-report survey, assessing their perceptions of the specific medical encounter.

All audio-recordings of the HCP-patient discussions were anonymized. These were then emailed through a secure file portal for external coding based on the Roter Interaction Analysis System (RIAS). (10,11) One RIAS coder categorized interactions according to the 41 standard RIAS categories. A second RIAS coder audited the coding trail on a random subset of audio-recordings, to ensure data quality and to establish the RIAS' reliability in this setting.

Finally, CR charts were audited at the institutional programs 2 months later. Where a patient was not referred, patients were telephoned at home to ascertain whether they had been referred to another CR program.

2.2 Participants

Participants and HCPs were approached on the cardiovascular units and at the Stroke Prevention Clinic to participate. HCP participants included all those working on the cardiac inpatient units, including surgical and interventional wards, as well as the outpatient Stroke Prevention Clinic. This included physicians, nurse-practitioners, nurses, and allied healthcare professionals (e.g., physiotherapists). In addition, peer mentors from the surgical ward who were registered with volunteer services were approached. While only physicians can sign-off on CR referrals in Ontario, it is generally nurses or allied

health professionals who discuss CR with patients and draft CR referral forms for physician signature. (12) The exclusion criterion was that the HCPs were not involved in direct patient care (i.e., nurse managers).

Patient inclusion criteria were: age 18 years or older, and having a clinical indication for CR based on clinical practice guidelines (e.g., acute coronary syndrome, post-procedure such as percutaneous coronary intervention or coronary artery bypass grafting surgery). (13) In the case of stroke patients, those with transient ischemic attacks and mild non-disabling strokes were eligible. Exclusion criteria were: (1) patients who were not eligible for CR due to comorbid musculoskeletal, neuromuscular, visual, cognitive or non-dysphoric psychiatric conditions (i.e., schizophrenia, advanced dementia); (2) being discharged to long-term care; (3) any serious or terminal illness not otherwise specified which would preclude CR participation (13); and (4) limited English-language proficiency. In addition, stroke patients who were unable to ambulate, and hence participate fully in CR, were excluded.

2.3 Measures

2.3.1 HCP characteristics

HCPs were asked to report their profession, highest degree obtained, year they graduated from their most advanced degree, sex, and estimated average number of patients seen in person daily. In addition, they were asked to rate their perceptions related to CR. The investigator-generated items were developed for a previous study, and therefore were pilot-tested in physician samples. (4,14)

2.3.2 Patient sociodemographic and clinical characteristics

On the survey, patients were asked to report their age, sex, marital status, racial/ethnic background, work status, and highest level of education. The survey also included the MacArthur Scale of Subjective Socioeconomic Status, (15) where participants were asked to demarcate their perceived status compared to others in Canada. Scale scores ranged from 1 to 10, with higher scores indicating greater subjective socioeconomic status (SES). A median split was computed, to categorize participants as high versus low subjective SES.

With regard to clinical characteristics, the survey also included the Duke Activity Status Index (DASI), (16) a brief 12-item self-administered survey used to determine functional capacity. The DASI inquires about a patient's ability to perform common activities of daily living, such as personal care, ambulation, household tasks, sexual function, and recreational activities, which are each associated with specific metabolic equivalents. This valid and common tool correlates highly with peak oxygen uptake. (17) Finally, clinical variables abstracted from patient medical charts included: index cardiovascular condition, risk factors, and previous history of cardiovascular disease.

2.3.3 HCP and patient perceptions of audio-recorded discussions

The HCP self-report survey assessed their perception of the quality of the audio-recorded interaction with their cardiovascular patient. This was measured on a 5-point Likert scale, from "poor" to "excellent", with higher scores indicating greater perceived quality. Additionally, HCP were asked whether the patient with whom they interacted will be referred to CR (yes/no).

The patient self-report surveys included items assessing their: (a) perceptions of HCP endorsement of CR, (b) awareness of CR, (c) perception of degree of patient-centeredness of the interaction, (d) perception of the likelihood they will be referred to CR, and (e) intentions to enroll in a CR program. These were assessed on a 5-point Likert scale, with greater scores indicating higher endorsement of the given construct. In order to further assess patient perception of their interaction, the following 4 items were administered: (a) ‘Did your HCP involve you as an equal partner in making decisions about illness management strategies and goals?’; (b) ‘Did your HCP listen carefully to what you had to say about your illness?’; (c) ‘Did your HCP encourage you to go to a specific group or class to help you manage your health condition?’; and (d) ‘Did your HCP convey that what you do to take care of yourself, influences your health condition?’. These were measured on a 5-point Likert scale, from “not at all” to “a great deal”. Finally, patients were asked if any family members were present during the audio-recorded interaction (yes/no).

2.3.4 Interaction analysis

To quantify the dialogue between patients and HCPs, audio-recordings were analyzed by RIAS-trained coders externally. RIAS is a standardized method of coding medical dialogue. It has been validated in several countries and healthcare settings(11), including in cardiac surgery patients. (18) The RIAS has been shown to be both reliable and valid.(11)

The unit of analysis was an utterance, defined as the smallest discriminable speech segment to which a coder could assign a classification, and which expressed or

implied a complete thought. This could vary from a single word, to a phrase, or a complete sentence. All utterances were assigned to 1 of the 29 mutually-exclusive and exhaustive categories for the patient, and 1 of 41 categories for the HCP. The broad categories are: data gathering, patient education and counseling, facilitation and patient activation, rapport-building and procedural.

Firstly, with regard to data gathering, these were utterances where patients described their condition in their own words, allowing HCPs to understand and ask the appropriate questions regarding their concerns. Data gathering questions were categorized as open or closed-ended. These utterances were also categorized as medical (e.g., “What can you tell me about the pain?”), therapeutic (e.g., “How are you doing with the pain medication?”), lifestyle (e.g., “Who’s living at home with you now?”), or psychosocial (e.g., “Are you anxious about leaving the hospital?”).

Second, patient education and counseling statements refer to utterances to facilitate patient’s understanding about their illness, and to motivate them to follow treatment recommendations. These utterance were also grouped into biomedical (i.e., medical condition, or therapeutic regimen) and psychosocial (i.e., lifestyle, or psychosocial issues) subcategories (e.g., “Getting exercise now is a good idea, especially now”- psychosocial counseling; “I’ve been working out in the yard most days” – lifestyle counseling; “My grandfather died of heart disease”- medical).

Third, facilitation and patient activation and partnership-building include participatory facilitators (i.e., asking for patient opinion, asking for understanding,

paraphrases, back-channels) and procedural talk (i.e., orientation, transitions) to improve the patients' ability to connect in an affective partnership with their HCP (e.g., "What do you think?" – asks for opinion; "Do you follow me?"- asks for understanding; "Mmm-huh, right, go on. "- back-channels; "Ah...wait a minute now..."- transitions). Lastly, rapport-building, fell within the scope of social talk (e.g., "How about the weather the past few days"- non-medical topic), positive talk (e.g., "I might get blown away in a strong wind"- laughter; "You look fantastic, you are doing great"- approvals), negative talk (e.g., "I think you are wrong, you were not being careful"- criticism; "Don't say I didn't warn you" – disagreement) and emotional talk (i.e., "I just want to know if I'm heading for the hospital again"- concern, worry; "I wouldn't worry about it, you'll be feeling better before you know it"- reassurance).

Finally, RIAS coders rated the global affect (i.e., the tonal qualities of the interaction) of each audio-recording. These tonal qualities transmit the emotional context of the audio-recording beyond the significance of the words spoken. Coders rated both the patient and HCP on a range of global affective dimensions including anger, anxiety, dominance, interest, friendliness, and interactivity. These were rated on a 5-point Likert scale from "low" to "high".

2.3.5 Dependent variable

CR charts were audited at the institutions' programs, to ascertain whether a referral to the program was made or not (yes/no). Where a patient was not referred, patients were telephoned at home to ascertain whether they had been referred to another CR program.

.3.6 Statistical analyses

Statistic Package for Social Sciences (SPSS) version 20.0 was used for all analyses. (19) Data were summarized with percentages for categorical variables, and by mean with standard deviation for continuous variables. Since the assumption of homogeneity of variance could not be assumed, non-parametric tests were applied (i.e., Mann-Whitney *U* or chi-square, as appropriate). $P < 0.05$ was used for all tests to indicate statistical significance. An initial descriptive analysis of HCP and patient characteristics was performed.

To test the first objective, a descriptive examination of patient and HCP perceptions of the interaction, and RIAS coding categories was performed. To test the second objective, Cohen's kappa was computed to ascertain the degree of concordance between HCP perception of patient referral and CR chart-reported referral.

To test the final objective, first, the CR referral rate was described. Next, HCP characteristics and perceptions were compared by the referral status of their patient (yes/no). Patient characteristics, attitudes and perceptions were similarly compared by CR referral. Moreover, RIAS coding was compared by CR referral. Finally, binary logistic regression analysis was used to examine the association of patient and RIAS factors identified as significantly related with CR referral (dependent variable) through the previous analysis. Any HCP characteristics significantly related to CR referral were excluded from the model, as there was insufficient power to compute generalized

estimating equations, which would be required to take into consideration of the nesting of patients by HCPs. Odds ratios (OR) with 95% confidence intervals (CI) were reported.

3. Results

3.1 Respondent characteristics

A diagram of study flow is shown in **Figure 1**. Of the 101 HCPs approached, 60 consented to participate in the study (59.4% response rate). Of these, valid audio-recordings were obtained with 26 (43.3%) HCPs. Their sociodemographic and work-related characteristics are summarized in **Table 1**. Health professions represented in the sample were: nurse-practitioners (n=5, 19.2%); cardiologists (n=2, 7.7 %); physiotherapists (n=2, 7.7%); a dietitian (n=1, 3.8%); pharmacist (n=1, 3.8%); and peer mentor (n=1, 3.8%).

One hundred and twelve patients were approached, of whom 58 (70.7% response rate) were considered eligible, and consented. Twenty-four (21.4%) patients declined to participate, and 30 (26.8%) were considered ineligible, for the following reasons: insufficient English-language proficiency (n=21, 70.0%), imminent discharge (n=1, 3.3%), patient already referred to CR (n=1, 3.3%), vision problems (n=1, 3.3%), and patient not cognitively-oriented to time and place (n=1, 3.3%). Of the participating patients, for two (6.7%) the tape quality was insufficient for coding both speakers, one (3.3%) patient's HCP changed, one (3.3%) patient was transferred to another hospital, and one (3.3%) patient did not have an interaction with a consenting HCP before discharge, and thus these 5 patients were subsequently excluded. The resultant sample

size is 50 patients. Their sociodemographic and clinical characteristics are summarized in **Table 2**.

3.2 Patient-HCP discussions

Of the 50 recorded discussions, 12 (46.2%) HCPs were recorded once, 7 (26.9%) HCPs were recorded twice (i.e., with 2 different patients), 4 (15.4%) were recorded three times, 1 (3.8%) was recorded four times, 1 (3.8%) was recorded six times, and 1 (3.8%) was recorded seven times. The discussions were on average 8.93 ± 8.84 (standard deviation) minutes in length. Forty-one (82.0%) recordings mentioned CR.

With regard to objective one, HCPs perceived the quality of interaction as 3.38 ± 0.99 on a 5-point Likert scale. Patient perceptions of the interaction are shown at the bottom of **Table 2**.

Table 3 displays the average frequency of each element of the discussions uttered by both HCPs and patients based on the RIAS coding. A second RIAS coder audited the coding trail on a random subset ($n=7$ cases) of audio-recordings, to ensure data quality and to establish the RIAS' reliability in the CR setting. The average inter-rater reliability was 0.896 for HCP talk and 0.924 for patient talk. Reliability of global affect ratings was reported at 100% percent agreement (within one-point on the rating scale).

3.3 CR referral

There were 35 (70.0%) patients referred to CR. With regard to objective two, 4 (15.4%) HCP reported they did not know whether their patient was referred. Of those that did know, 20 (76.9%) HCPs perceived their patients were referred. The concordance

between HCP perceptions of patient referral with actual CR referral was 0.095 (Cohen's κ).

To test the final objective, differences in CR referral rates were explored. Length of recording ($p=0.58$), as well as HCP sociodemographic and work-related characteristics were unrelated to CR referral (**Table 1**). However, HCPs who reported treating more patients per day were significantly less likely to refer than those reporting treating fewer patients. With regard to patient characteristics, there were no significant differences in sociodemographic or clinical characteristics between patients who were referred and those who were not (**Table 2**).

Some patient-reported perceptions of the discussions were significantly related to CR referral (**Table 2**). As shown, patients who perceived greater encouragement from their HCPs to go to a class to help manage their cardiovascular disease, and those that perceived their HCP more strongly conveyed that their health behavior will influence their condition, were significantly more often referred to CR.

Based on the RIAS codes, some elements of the discussions were also related to CR referral (**Table 3**). With regard to HCP utterances, when they more often asked patients for their opinions, patients were more likely to be referred to CR. With regards to patient utterances, those who expressed concern and worry within their discussions, were significantly less likely to be referred to CR. Moreover, the affect-related rating of interactivity was also related to greater CR referral. Finally, there were trends towards

greater CR referral where HCPs gave therapeutic information, and provided less reassurance and optimism to patients.

Finally, the logistic regression model testing the effects of these variables in relation to CR referral is presented in **Table 4**. HCP request for opinion was excluded from the model due to insufficient sample size. As shown in **Table 3**, this element was not common in the recorded discussion. Moreover, volume of patients per day was also excluded due to concerns regarding intra-class correlations. The logistic regression model was significant overall ($F=16.73$, $p<.01$), and the model accounted for 42% of the variance in referral rates (Nagelkerke $R^2=0.415$). As shown, patients were almost three times more likely to be referred to CR where HCPs were more interactive in the discussion, and were 36% less likely to be referred if they exhibited more concern and worry during their interaction.

4. Discussion and Conclusion

4.1 Discussion

This is the first study to have examined the nature of patient-HCP communication regarding CR referral. The discussions most-often consisted of nurses and patients sharing information about their care, and showing understanding and agreement. The discussions were perceived very positively by patients, but contrarily HCPs perceived the quality of the conversations as low. Moreover, HCPs were not often cognizant of whether or not their patients were referred to CR, and their referral rates were inversely related to

their patient care volume. Overall, discussions where patients expressed less worry and HCPs were more interactive were associated with CR referral.

The majority of the interactions were centered on HCPs giving therapeutic information and patients showing agreement and understanding. It was disconcerting that HCPs perceived their interactions were such poor quality, and that they quite rarely were cognizant whether a patient was referred. The latter can perhaps be explained by the fact that nurses, the most common HCP type in this study, cannot sign-off on a CR referral in the province where the study was conducted. They would have to complete the form and pass it to a nurse-practitioner or physician to sign the form. However, in accordance with a recent statement from the American Heart Association, it is recommended that all HCPs should be involved in the referral process(20), so that CR utilization rates can be increased.

The former finding that HCPs were unsatisfied with the quality of the recorded interactions, as well as that having fewer patients under their charge, and engaging in greater interactivity (which was unfortunately not a common occurrence in the recordings), were related to greater patient CR referral, suggests that there may be room to increase the time spent and improve the quality of CR referral discussions at the bedside. This is especially important since HCP endorsement of CR is found to be the principle predictor for both CR referral and enrollment. (21–23) Indeed, previous research has established the importance of interpersonal communication for patient health outcomes,(24) and that HCPs can be successfully trained to improve the quality of their

communication.(25) Indeed, even short-term training, of less than 10 hours, is successful in improving HCP communication skills.(26) While time is certainly limited in the current era of short hospital stays(27), given the substantive benefits of CR(7), and that adoption of other secondary prevention measures post-hospitalization are much higher than they are for CR,(28) it is imperative that we develop some proven strategies to ensure CR referral and enrollment-enhancing patient communication before every indicated patient is discharged.

Caution is warranted when interpreting these results. First, the study was limited by the small number of audio-recorded discussions. It is possible that other conversational elements were related to CR referral, but that the study was under-powered to detect such differences. Given this is the first study of this nature, replication with a larger sample would enable ascertainment of “true” conversational elements which may be related to CR. Second, the study is limited in its generalizability. Specifically, the study was conducted in an environment where CR is paid mostly through provincial health insurance, so the issues identified herein may not be applicable in systems with other payment models As well, results may not be generalizable to individuals who are not proficient in English, since the survey was only available in this language. Third, the results are potentially biased due to selection issues, particularly that HCPs who consented to participate may not be representative of all HCPs. Participating patients and HCP may have been more positive in their attitudes and perceptions of CR than those who did not participate. Fourth, in the absence of blinding, an expectation bias could have impacted the discussions. For instance, the recorded discussions may have been

more likely to concern CR, than discussions that are not recorded. It is also possible that HCPs took extra care to optimize their communication, in a way that they would not have, if their discussions were not being recorded. It is likely that the frequency and quality of CR discussions is lower in the real world. This is also supported by the relatively high rate of CR referral in this study, than what is observed in population-based studies.(29) Fifth, the time-limited nature of the recordings meant that we would not capture CR conversations that may have occurred at other points in the patient continuum of care. These other discussions or interactions with other HCP may have been influenced by whether or not the patient was referred to CR, as well as the overall patient experience during their hospital stay (i.e., unrelated to the CR discussion). Finally, some patients may not have been referred to CR for valid personal or clinical reasons which were uncharted, and hence unmeasured in the current study. Replication is warranted to ensure the findings are robust and not explained by alternative factors.

4.2 Conclusion

In conclusion, patient-HCP discussions about CR tend to involve HCPs giving information about therapy, followed by patients showing understanding and agreement. In addition these discussions involved HCP giving information and counseling around medical, psychosocial and therapeutic regimens, patients giving information surrounding their lifestyle, followed by their medical and therapeutic concerns. Discussions marked by greater interactivity and less patient concern and worry were related to greater patient CR referral. Further research to assess whether HCPs can be trained to communicate in a referral-enhancing manner, such that patient referral rates are increased is warranted.

4.3 Practice Implication

Better communication is needed between HCPs, as well as patients and HCPs to ensure CR referral is undertaken. Inpatient cardiac teams should develop a process to chart when a referral is made, so other HCPs are aware whether the referral has been made, and if not to refer the patient before discharge. Moreover, patients who communicate concern or worry would likely benefit from CR participation, and hence this should not serve as a HCP barrier to referral. Given it is difficult for HCPs to make more time for patient education regarding CR, perhaps enlisting previous graduates to volunteer to speak with patients at the bedside could overcome this obstacle.

4.4 Policy Implications

CR is not only clinically effective, but also cost-effective compared with other medical interventions performed commonly in patients with CAD. Ades et al. (73) showed that compared to cholesterol-lowering drugs, thrombolytic therapy, and coronary artery bypass graft surgery, CR was more cost-effective following myocardial infarction. Though CR was less cost-effective than smoking cessation programs, Oldridge et al. (74) showed that participation in a 12-week CR program decreased medical costs by \$739 per patient after only a 21 month follow-up. Even more importantly, during the 1-year follow-up, CR patients had fewer 'other rehabilitation visits' (75) and gained 0.052 more quality-adjusted life-years than the usual care group. In Sweden, Levin et al., (76) demonstrated that following bypass surgery or myocardial infarction (5-year follow up), participating in CR decreased re-hospitalizations from 16 to 11 days, increased the rate of

return to work from 38% to 53% and resulted in an overall cost savings of \$12,000 per patient.

In 2006, Candido et al., (31) conducted a cross-sectional, population-based study examining the relationship between need and capacity for indicated patients in a multidisciplinary CR program, in Ontario. Assuming that only those with recent cardiac hospitalization were eligible for secondary preventive CR, only 34% of the eligible population would have had access to services. The need (i.e., number of patients indicated for CR) exceeded the supply. The government needs to ensure placement availability through the growth and expansion of additional programs (e.g., community-based programs). Additionally, funding through private sponsors (i.e., private/public collaboration) could support the development of new CR programs and/or services.

In Ontario, physicians are paid, at least in part, on a fee-for-service basis. In order to better promote patient participation in CR, the medical training programs should ensure students learn about CR the importance of referral. In the United States, a new pay-for-performance program has been instituted where physicians get paid for CR referral. The effects of this program needs to be observed, and potentially replicated in Canada.

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I confirm all patient/personal identifiers have been removed or disguised so the patient/person (s) described are not identifiable and cannot be identified through the details of the story.

References

1. World Health Organization. Cardiovascular Diseases. 2012. Available from:
<http://www.who.int/mediacentre/factsheets/fs317/en/index.html>
2. Prior PL, Hachinski V, Unsworth K, Chan R, Mytka S, O'Callaghan C, Suskin N. Comprehensive cardiac rehabilitation for secondary prevention after transient ischemic attack or mild stroke: I: Feasibility and risk factors. *Stroke: A Journal of Cerebral Circulation*. 2011;42:3207–13.
3. Sacco RL, Adams R, Albers G, Alberts MJ, Benavente O, Furie K, Goldstein LB, Gorelick P, Halperin J, Harbaugh R, Johnston SC, Katzan I, Kelly-Hayes M, Kenton EJ, Marks M, Schwamm LH, Tomsick T. Guidelines for Prevention of Stroke in Patients With Ischemic Stroke or Transient Ischemic Attack A Statement for Healthcare Professionals From the American Heart Association/American Stroke Association Council on Stroke: Co-Sponsored by the Council on Cardiovascular and Stroke Nursing. *Stroke*. 2006;37:577–617.
4. Grace SL, Gravely-Witte S, Brual J, Monette G, Suskin N, Higginson L, Alter DA, Stewart DE. Contribution of patient and physician factors to cardiac rehabilitation enrollment: A prospective multilevel study. *European Journal of Cardiovascular Prevention and Rehabilitation*. 2008;15:548–56.

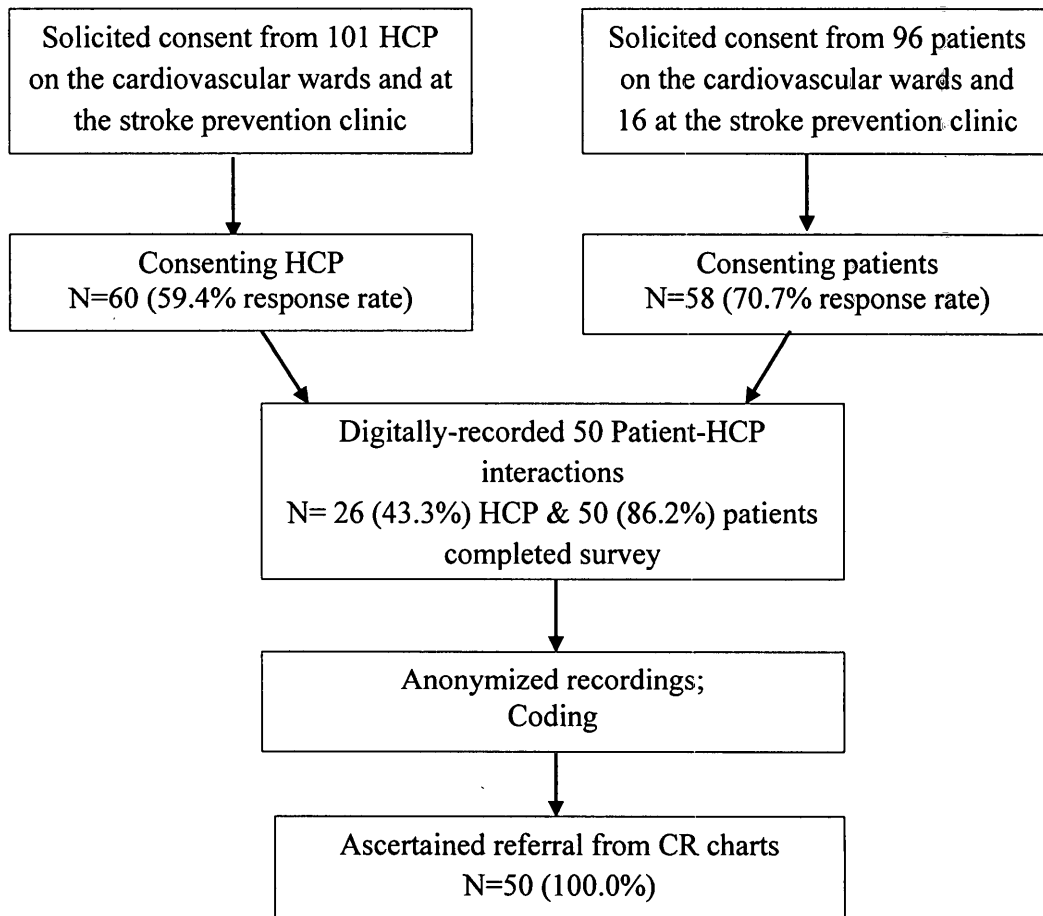
5. Tang A, Marzolini S, Oh P, McIlroy WE, Brooks D. Feasibility and effects of adapted cardiac rehabilitation after stroke: A prospective trial. *BMC Neurology*. Department of Physical Therapy, University of Toronto, Canada.; 2010;10:40.
6. Lennon O, Carey A, Gaffney N, Stephenson J, Blake C. A pilot randomized controlled trial to evaluate the benefit of the cardiac rehabilitation paradigm for the non-acute ischaemic stroke population. *Clinical Rehabilitation*. 2008;22:125–33.
7. Heran BS, Chen JM, Ebrahim S, Moxham T, Oldridge N, Rees K, et al. Exercise-based cardiac rehabilitation for coronary heart disease. *Cochrane Database of Systematic Reviews*. 2011:91.
8. Thomas RJ, King M, Lui K, Oldridge N, Piña IL, Spertus J. AACVPR/ACCF/AHA 2010 Update: Performance Measures on Cardiac Rehabilitation for Referral to Cardiac Rehabilitation/Secondary Prevention Services Endorsed by the American College of Chest Physicians, the American College of Sports Medicine, the American Ph. *Journal of the American College of Cardiology*. 2010;56:1159–67.
9. Grace SL, Abbey SE, Shnek ZM, Irvine J, Franche RL, Stewart DE. Cardiac rehabilitation II: Referral and participation. *General Hospital Psychiatry*. Elsevier; 2002;24:127–34.

10. The Roter Interaction Analysis System (RIAS). Evidence- based communication for education research and practice. Available from:
http://riasworks.com/about_us.html.
11. Roter D, Larson S. The Roter interaction analysis system (RIAS): Utility and flexibility for analysis of medical interactions. *Patient Educ Couns*. 2002;46:243–51.
12. Grace SL, Evindar A, Abramson BL, Stewart DE. Physician management preferences for cardiac patients: Factors affecting referral to cardiac rehabilitation. *The Canadian Journal of Cardiology*. 2004;20:1101–7.
13. Stone JA, Arthur HM, Suskin N. Canadian guidelines for cardiac rehabilitation and cardiovascular disease prevention: Translating knowledge into action (3rd edition). Canadian Association of Cardiac Rehabilitation. 2009.
14. Grace SL, Gravely-Witte S, Brual J, Suskin N, Higginson L, Alter D, Stewart DE. Contribution of patient and physician factors to cardiac rehabilitation referral: A prospective multilevel study. *Nature Clinical Practice Cardiovascular Medicine*. 2008;5:653–62.
15. John, D. and MacArthur CT. The MacArthur Scale of Subjective Social Status. Research Network on Socioeconomic Status and Health.. 2000.

16. Hlatky MA, Boineau RE, Higginbotham MB, Lee KL, Mark DB, Califf RM, Cobb FR, Pryor DB. A brief self-administered questionnaire to determine functional capacity (the Duke Activity Status Index). *The American Journal of Cardiology*. 1989;64:651–4.
17. Nelson CL, Herndon JE, Mark DB, Pryor DB, Califf RM, Hlatky MA. Relation of clinical and angiographic factors to functional capacity as measured by the Duke Activity Status Index. *The American Journal of Cardiology*. 1991;68:973–5.
18. Van Weert J, Van Dulmen S, Bär P, Venus E. Interdisciplinary preoperative patient education in cardiac surgery. *Patient Educ Couns*. 2003;49:105–14.
19. IBM Corp. IBM SPSS Statistics for Windows: Version 20.0. Armonk, NY: IBM Corp.; 2011.
20. Arena R, Williams M, Forman DE, Cahalin LP, Coke L, Myers J, Hamm L, Kris-Etherton P, Humphrey R, Bittner V, Lavie C. Increasing referral and participation rates to outpatient cardiac rehabilitation: The valuable role of healthcare professionals in the inpatient and home health settings: a science advisory from the American Heart Association. *Circulation*. 2012;125:1321–9.
21. Jackson L, Leclerc J, Erskine Y, Linden W. Getting the most out of cardiac rehabilitation: a review of referral and adherence predictors. *Heart*. 2005;91:10–4.

22. Ades PA, Waldmann ML, McCann WJ, Weaver SO. Predictors of cardiac rehabilitation participation in older coronary patients. *Archives of Internal Medicine*. 1992;152:1033–5.
23. Shanks LC, Moore SM, Zeller RA. Predictors of cardiac rehabilitation initiation. *Rehabilitation Nursing*. 2007;32:152–7.
24. Bartlett EE, Grayson M, Barker R, Levine DM, Golden A, Libber S. The effects of physician communications skills on patient satisfaction; recall, and adherence. *Journal of Chronic Diseases*. 1984;37:755–64.
25. Kim YM, Rimon J, Winnard K, Corso C, Mako I V, Lawal S, Babalola S, Huntington D. Improving the quality of service delivery in Nigeria. *Studies in Family Planning*. 2013;23:118–27.
26. Dwamena F, Holmes-Rovner M, Gaulden CM, Jorgenson S, Sadigh G, Sikorskii A, Lewin S, Smith R, Coffey J, Olomo A. Interventions for providers to promote a patient-centred approach in clinical consultations. *Cochrane Database of Systematic Reviews*. 2012 Jan;12:CD003267.
27. Mitoff PR, Wesolowski M, Abramson BL, Grace SL. Patient-provider communication regarding referral to cardiac rehabilitation. *Rehabilitation Nursing*. 2005;30:140–6.

28. Kottke TE, Faith D a, Jordan CO, Pronk NP, Thomas RJ, Capewell S. The comparative effectiveness of heart disease prevention and treatment strategies. *American Journal of Preventive Medicine*. *American Journal of Preventive Medicine*; 2009;36:82–8.
29. Suaya JA, Shepard DS, Normand S-LT, Ades P a, Prottas J, Stason WB. Use of cardiac rehabilitation by Medicare beneficiaries after myocardial infarction or coronary bypass surgery. *Circulation*. 2007;116:1653–62.
30. Chan B, Coyte P, Heick C. Economic impact of cardiovascular disease in Canada. *Can J Cardiol*. 2013;12:1000–6.
79. Candido E, Richards J a, Oh P, Suskin N, Arthur HM, Fair T, et al. The relationship between need and capacity for multidisciplinary cardiovascular risk-reduction programs in ontario. *Can J Cardio*. 2011;27:200–7.
80. Arthur HM, Swabey T, Suskin N, Ross J. The Ontario Cardiac Rehabilitation Pilot Project: Recommendations for health planning and policy. *Can J Cardiol*. 2004;20:1251–5.

Figure 1. Study Flow Diagram

Note: CR; Cardiovascular Rehabilitation; HCP- Healthcare Provider

Table 1. Participating Healthcare Provider Characteristics, as well as Attitudes and Perceptions Related to CR

Characteristics	Patient CR Referral			<i>p</i>
	Total N=26	Yes n=35 (70.0%)	No n=15 (30.0%)	
Sex (% female)	19 (73.1)	11 (78.6)	8 (66.7)	0.50
Highest Degree Obtained (% undergraduate degree)	9 (34.6)	4 (28.6)	5 (41.7)	0.19
Year obtained highest academic qualification	1992±15	1993±14	1990±16	0.66
Profession (% nurse)	13 (50.0)	8 (57.1)	5 (41.7)	0.45
Estimated number of patients seen/day	8.19±5.48	5.50±1.61	11.33±6.72	<.05
Mean % of eligible patients referred or recommended to CR by HCP	77.83±29.25	81.08±27.89	74.58±31.44	0.77
CR awareness /5 (mean ± SD)*	3.96±0.77	4.00±0.78	3.92±0.79	0.78

Note: CR- Cardiovascular Rehabilitation; HCP- Healthcare Provider; SD- Standard Deviation

*CR awareness scores ranged from 1 “poor” to 5 “excellent” on a 5-point Likert scale

Table 2. Sociodemographic and Clinical Characteristics of Patients

Characteristics	CR Referral			<i>p</i>
	Total N=50	Yes n=35 (70.0%)	No n=15 (30.0%)	
Sociodemographic				
Age, years (mean ± SD)	65.48±12.95	66.37±10.36	63.40±17.87	0.88
Sex (% female)	14(28.0)	8 (22.9)	6 (40.0)	0.22
Marital Status (% married)	33 (66.0)	24 (68.6)	9 (60.0)	0.56
Ethnicity (% white/Caucasian)	27 (54.0)	19 (54.3)	8 (53.3)	0.95
Work Status (% retired)	35 (70.0)	22 (62.9)	13 (86.7)	0.09
Education (% post-secondary)	17 (34.0)	9 (25.7)	8 (53.3)	0.06
Subjective SES/10 (mean ± SD)	6.55±1.31	6.65±1.32	6.33±1.29	0.22
Clinical				
CR Indication				
<i>PCI (% yes)</i>	23 (46.0)	19 (54.3)	4 (26.7)	0.07
<i>Stroke (% yes)</i>	8 (19.5)	5 (17.2)	3 (25.0)	0.57
<i>HF (% yes)</i>	7 (14.0)	5 (14.3)	2 (13.3)	0.93
<i>MI (% yes)</i>	4 (8.2)	2 (5.9)	2 (13.3)	0.38
BMI (mean ± SD)	27.36±5.35	28.04±5.62	25.81±4.45	0.16
Diabetes (%)	15 (30.6)	132 (35.3)	2 (20.0)	0.28
Hypertension (%)	33 (66.0)	26 (74.3)	7 (46.7)	0.06
Dyslipidemia (%)	32 (64.0)	25 (71.4)	7 (46.7)	0.10
Previous CAD (%)	24 (48.0)	19 (54.3)	5 (33.3)	0.17
DASI (mean ± SD)	29.58±15.56	29.68±15.67	29.34±15.83	0.76
Patient Perception of CR				
Perceived strength of CR endorsement /5, (mean ± SD)	4.07±0.72	4.00±0.78	4.27±0.47	0.34
Perceives they will be referred (%yes)	38 (86.4)	30 (88.2)	8 (80.0)	0.51
Intention to enroll /5, (mean ± SD)	3.49±1.44	3.61±1.34	3.21±1.67	0.53
CR awareness /5, (mean ± SD)	3.22±1.34	3.15±1.33	3.40±1.40	0.52

HCP- Patient Audio-recoding Experience

Did your HCP involve you as an equal partner in making decisions about illness management strategies and goals?*	4.04±1.00	4.20±0.90	3.64±1.15	0.11
Did your HCP listen carefully to what you had to say about your illness?*	4.29±0.91	4.40±0.77	4.00±1.18	0.33
Did your HCP encourage you to go to a specific group or class to help you manage your health condition?*	4.12±1.13	4.40±0.74	3.43±1.60	<.05
Did your HCP convey that what you should do to take care of yourself influences your health condition?*	4.27±0.91	4.46±0.74	3.79±1.12	<.05
Patient-centeredness of interaction, (mean ± SD) / 5	4.29±0.94	4.44±0.75	3.93±1.27	0.20
Family present during audiorecorded discussion (% yes)	26 (53.1)	18 (51.4)	8 (57.1)	0.72

Note: SES- Socioeconomic Status; PCI- Percutaneous Coronary Intervention; HF- Heart Failure; MI-Myocardial Infarction; BMI- Body mass index;

DASI- Duke Activity Status Index; CR- Cardiac Rehabilitation; HCP- Healthcare provider

*Chi- square test for categorical variables and Man-Whitney *U* were performed for continuous variables by CR referral

**scores ranged from 1 “not at all” to 5 “a great deal”

Table 3. Mean Frequency (\pm standard deviation) of RIAS Discussion Elements and Global Affect Ratings* by CR Referral, in Descending Order

Code	CR Referral			<i>p</i>
	Total N=50	Referred to CR n=35 (70.0%)	Not Referred to CR n=15 (30.0%)	
HCP: Gives information- therapeutic	38.38 \pm 36.97	42.29 \pm 37.91	29.27 \pm 34.14	0.08
Pt: Shows agreement, understanding	33.20 \pm 29.44	36.26 \pm 30.59	26.07 \pm 26.13	0.20
HCP: Counsels- medical/therapeutic	14.20 \pm 19.98	16.29 \pm 20.99	9.33 \pm 17.04	0.14
HCP: Shows agreement, understanding	11.94 \pm 12.81	13.37 \pm 14.68	8.60 \pm 5.84	0.35
Pt: Gives information- lifestyle	10.16 \pm 12.84	8.89 \pm 12.27	13.13 \pm 14.07	0.30
HCP: Back-channels	9.84 \pm 9.10	9.11 \pm 9.81	11.53 \pm 7.22	0.09
Pt: Gives information- medical	8.86 \pm 12.50	9.49 \pm 14.31	7.40 \pm 6.76	0.53
Pt: Gives information- therapeutic	8.10 \pm 8.15	7.83 \pm 7.93	8.73 \pm 8.91	0.77
HCP: Counsels- lifestyle/ psychosocial	6.82 \pm 17.38	8.60 \pm 20.46	2.67 \pm 3.70	0.41
HCP: Paraphrase, checks for understanding	6.52 \pm 9.36	6.97 \pm 10.70	5.47 \pm 5.21	1.00
HCP: Gives information- medical	6.28 \pm 10.41	7.20 \pm 11.70	4.13 \pm 6.32	0.34
HCP: Gives information- lifestyle	5.82 \pm 7.44	5.63 \pm 6.76	6.27 \pm 9.09	0.75
HCP: Reassures, optimism	5.32 \pm 6.52	4.80 \pm 6.97	6.53 \pm 5.34	0.06
HCP: gives orientation, instructions	5.08 \pm 8.67	5.91 \pm 10.11	3.13 \pm 3.02	0.66
HCP: Ask for understanding	4.50 \pm 6.53	5.09 \pm 7.31	3.13 \pm 4.07	0.45
Pt: Interest/ attentiveness*	4.36 \pm 0.69	4.29 \pm 0.67	4.53 \pm 0.74	0.17
Pt: Paraphrase, checks for understanding	3.82 \pm 4.65	4.20 \pm 4.95	2.93 \pm 3.90	0.24
HCP: Friendliness/ warmth	3.82 \pm 0.69	3.89 \pm 0.72	3.67 \pm 0.62	0.33
HCP: Interactivity*	3.72 \pm 0.88	3.89 \pm 0.83	3.33 \pm 0.90	<.05
Pt: Friendliness/warmth	3.72 \pm 0.70	3.71 \pm 0.71	3.73 \pm 0.70	0.91
HCP: Responsiveness/ engagement	3.70 \pm 0.84	3.80 \pm 0.83	3.47 \pm 0.83	0.22
HCP: Sympathetic/ empathetic	3.62 \pm 0.60	3.57 \pm 0.61	3.73 \pm 0.59	0.35
Pt: All questions –therapeutic	3.54 \pm 4.90	4.00 \pm 5.49	2.47 \pm 3.04	0.41
HCP: Dominance/ assertiveness	3.44 \pm 0.54	3.51 \pm 0.51	3.27 \pm 0.59	0.17
Pt: Interactivity	3.30 \pm 0.79	3.37 \pm 0.81	3.13 \pm 0.74	0.40
Pt: Responsiveness /engagement	3.28 \pm 0.70	3.37 \pm 0.69	3.07 \pm 0.70	0.20
HCP: Hurried/ rushed	3.28 \pm 1.34	3.11 \pm 1.32	3.67 \pm 1.35	0.14
Pt: Dominance/ assertiveness	3.22 \pm 0.51	3.20 \pm 0.53	3.27 \pm 0.46	0.72
HCP: Concern, worry	3.16 \pm 5.34	3.66 \pm 6.03	2.00 \pm 3.02	0.59

Pt: Reassures, optimism	3.04±2.70	2.63±2.18	4.00±3.55	0.27
HCP: Respectfulness	3.02±0.14	3.03±0.17	3.00±0.00	0.51
Pt: Respectfulness	3.00±0.29	2.97±0.30	3.07±0.26	0.28
Pt: Sympathetic/empathetic	2.98±0.14	2.97±0.17	3.00±0.00	0.51
HCP: Approval- direct	2.86±3.72	2.71±3.74	3.20±3.78	0.70
Pt: Laughs, tell jokes	2.84±4.42	2.83±4.36	2.87±4.72	0.82
HCP: Closed question- medical	2.80±4.65	3.06±5.37	2.20±2.24	0.40
HCP: Gives information- psychosocial	2.38±8.51	3.00±10.03	0.93±2.46	0.95
HCP: Closed question- lifestyle	2.18±4.22	2.46±4.49	1.53±3.56	0.39
HCP: Transitions	2.06±2.45	2.37±2.67	1.33±1.72	0.20
HCP: Closed question- therapeutic	2.04±3.14	2.40±3.63	1.20±1.21	0.69
Pt: Approval- direct	2.02±2.85	1.80±2.23	2.53±4.00	0.55
Pt: Unintelligible utterance	2.00±3.21	2.06±3.69	1.87±1.77	0.39
Pt: Gives information -psychosocial	2.00±4.38	1.66±2.87	2.80±6.81	0.44
Pt: Concern, worry	1.80±2.23	1.37±1.86	2.80±2.73	<.05
HCP: Laughs, tells jokes	1.72±2.29	1.71±2.38	1.73±2.12	0.95
HCP: Personal remarks	1.68±2.90	1.54±2.76	2.00±3.30	0.77
HCP: Asks for opinion	1.66±2.02	1.91±2.06	1.07±1.83	0.05
Pt: Anxiety/ nervousness	1.44±0.64	1.40±0.60	1.53±0.74	0.60
Pt: Personal remarks	1.14±1.97	0.97±1.67	1.53±2.56	0.54
Patient: Anger/ irritation	1.02±0.14	1.03±0.17	1.00±0.00	0.51
HCP: Anger/ irritation	1.00±0.00	1.00±0.00	1.00±0.00	1.00
HCP: Anxiety/ nervousness	1.00±0.00	1.00±0.00	1.00±0.00	1.00
Pt: Emotional distress/ upset	1.00±0.00	1.00±0.00	1.00±0.00	1.00
Pt: Depression/ sadness	1.00±0.00	1.00±0.00	1.00±0.00	1.00
Pt: Transitions	0.86±1.21	0.83±1.36	0.93±0.80	0.21
HCP: Gives information -other	0.76±2.08	0.51±1.17	1.33±3.35	0.50
HCP: Open question -medical	0.72±1.75	0.80±1.97	0.53±1.13	0.75
Pt: All questions -lifestyle	0.62±0.95	0.74±1.07	0.33±0.49	0.30
Pt: All questions -medical	0.52±1.34	0.60±1.54	0.33±0.72	0.77
HCP: Unintelligible	0.52±0.95	0.40±0.74	0.80±1.32	0.49
Pt: Asks for understanding	0.50±0.84	0.46±0.85	0.60±0.83	0.44
Pt: Gives orientation, instructions	0.50±0.95	0.54±1.04	0.40±0.74	0.68
HCP: Open question -therapeutic	0.46±0.95	0.60±1.09	0.13±0.35	0.13
Pt: Gives information -other	0.46±1.33	0.49±1.44	0.40±1.06	0.54

Pt: Disagreement, criticism-direct	0.42±0.93	0.37±0.81	0.53±1.19	0.89
Pt: Open question -lifestyle	0.34±1.47	0.43±1.74	0.13±0.35	0.94
HCP: Closed question -other	0.32±1.08	0.37±1.26	0.20±0.41	0.73
HCP: Disagreement, criticism - direct	0.24±0.56	0.20±0.47	0.33±0.72	0.70
HCP: Self-disclosure	0.20±0.64	0.23±0.73	0.13±0.35	0.91
HCP: Asks for reassurance	0.20±0.49	0.20±0.47	0.20±0.56	0.79
HCP: Legitimation statements	0.20±0.64	0.17±0.57	0.27±0.80	0.82
Pt: Asks for reassurance	0.18±0.56	0.14±0.55	0.27±0.59	0.27
Pt: Compliment -general	0.16±0.51	0.20±0.58	0.07±0.26	0.57
Pt: All questions -psychosocial	0.16±0.62	0.20±0.72	0.07±0.26	0.79
HCP: Bid for repetition	0.14±0.53	0.14±0.55	0.13±0.52	0.84
HCP: Compliment- general	0.14±0.64	0.03±0.17	0.40±1.12	0.14
Pt: Disagreement, criticism-general	0.14±0.40	0.14±0.43	0.13±0.35	0.88
HCP: Closed question -psychosocial	0.12±0.33	0.09±0.28	0.20±0.41	0.26
HCP: Asks for permission	0.12±0.39	0.17±0.45	0.00±0.00	0.13
HCP: Open question -psychosocial	0.12±0.39	0.14±0.43	0.07±0.26	0.60
HCP: Partnership statements	0.12±0.33	0.11±0.32	0.13±0.35	0.85
Pt: All questions -other	0.10±0.36	0.09±0.37	0.13±0.35	0.39
HCP: Empathy statements	0.08±0.34	0.06±0.34	0.13±0.35	0.17
HCP: Disagreements, criticism -general	0.06±0.31	0.09±0.37	0.00±0.00	0.35
Pt: Bid for repetition	0.02±0.14	0.00±0.00	0.07±0.26	0.13

Note: Pt- Patient; HCP- Healthcare Provider; RIAS- Roter Analysis Interaction System

*p<0.05, **p<.01, ***p<.001 for Mann-Whitney U comparing mean frequency of RIAS utterances by CR referral.

**RIAS coding categories not used: Pt talk- Asks for service; Pt talk- Legitimation statements; Pt talk- Empathy statements; HCP talk- Open question- other.

Table 4. Logistic Regression Model Testing Significance of Discussion Perceptions and Elements by CR Referral

Patient- HCP Experience/ Utterances	β	SE	Wald	p	e^{β}	95% CI	
						Lower Limit	Upper Limit
Did your HCP encourage you to go to a specific group or class to help you manage your health condition?	0.66	0.61	1.17	0.28	1.94	0.58	6.48
Did your HCP convey that what you should do to take care of yourself influences your health condition?	0.14	0.84	0.03	0.86	1.16	0.22	5.99
Pt: Concern, Worry	-0.45	0.17	6.76	0.01	0.64	0.45	0.89
HCP: Interactivity	1.04	0.52	3.94	<0.05	2.82	1.01	7.86

Note: CR- Cardiovascular Rehabilitation; CI- Confidence Interval; HCP- Healthcare Provider; e^{β} – Odds Ratio; Pt- Patient; SE- Standard Error

Extended Methods

Considerations in Selection of Interaction Analysis System

RIAS is one of the many tools available for interaction analysis. Other interaction software tools include: (1) Transana (<http://www.transana.org/>) widely used to analyze digital video or audio data; (2) The Observer (<http://www.noldus.com>) designed initially for studying animal behaviour patterns, has recently been adopted to more general coding within the social sciences; (3) Interact (<http://www.mangold-international.com>) used in the process of coding videos; (4) Studiocode (<http://www.studiocodegroup.com>) used in real time coding of videos; and (5) Digital Replay System (<http://thedrs.sourceforge.net/>) which allows data analysts to interrogate large heterogeneous data sets by supporting a synchronized playback of multimedia file types. The RIAS system was adopted in this study for the following reasons: the system's ability to provide reasonable depth, sensitivity, and breadth while maintaining practicality, function specificity, flexibility, reliability, and predictive validity with medical dialogue.(66) There are limitations to the RIAS system however. RIAS has addressed many of these limitations, (6) but a weakness which still remains in research relative to medical communication is the limited theoretical focus used to guide investigators in making basic judgments regarding what to measure, when, and why. This inconsistency has contributed largely to the exploratory nature of work within this field with little conceptual framing of results.

Rationale for Statistical Approach

With regards to the statistical analysis, to test the final objective, a binary logistic regression analysis was used to examine the association of patient and RIAS factors

identified as significantly related with CR referral and enrollment. Our sample size was the main determinant in deciding the number of independent variables that could be entered in the model. The sample size of 50 audiorecordings would support a maximum of 5 independent variables, as per the rule of thumb of a sample size of 10 per variable. Conclusions should be cautiously interpreted when the number of independent variables increase and the outcomes per variable decreases, creating bias and variability, and unreliable confidence interval intervals.

Exploratory Study

This was an exploratory feasibility study used to systematically investigate patient-HCP discussions regarding CR. Although, exploratory research is not typically generalizable to the population at large, these preliminary results can form the basis for hypothesis generation for future research. Finally, due to the exploratory nature of the study, power calculations were not performed to determine sample size a priori.

Extended Results

As per the thesis, this section will provide the results for the objectives that were not presented in the manuscript. With regard to the first objective, RIAS codes of the patient-HCP discussions regarding CR is shown in **Table 3** of the manuscript. With regard to the study-specific coding generated (Appendix K), **Table 5** displays these elements.

With regard to objective 2, elements of the patient-HCP interaction regarding CR based on RIAS coding are compared by patient sociodemographic and clinical

characteristics (see **Table 6**). Non-parametric tests were applied as homogeneity of variance could not be assumed. Therefore the Mann-Whitney U-test, or Spearman's correlation were computed, as appropriate. The most-frequent RIAS utterances were analyzed in terms of their relation to CR referral and enrollment.

As shown, with regard to sociodemographic characteristics, there were significant differences in the following utterances: patient showing agreement and understanding, patient giving information about lifestyle, HCP back-channels, and HCP reassurance and optimism. Specifically, patients who were unmarried and self-reported being white/Caucasian were significantly more likely to give lifestyle information during the discussion. HCPs more often back-channeled with unmarried, female patients. As well, HCP more often asked for opinion with patients often bothered by feeling down, hopeless and depressed. Finally, HCPs provided significantly more reassurance and optimism to patients with lower SES.

With regard to clinical characteristics, patients with higher activity status (i.e., DASI) received significantly more therapeutic information and medical / therapeutic counseling from their HCPs, and showed more agreement and understanding than patients with lower activity status. With regard to clinical indication for CR, HCPs showed significantly more agreement and understanding with heart failure patients, significantly less back-channels with percutaneous coronary intervention patients, and less often asked for patient opinions and were less interactive with stroke patients. HCPs provided significantly greater reassurance and conveyed more optimism to patients with less body mass index and that did not have hypertension. HCPs did less back-channeling

with patients with dyslipidemia than patients without. Finally, patients reporting more depressive symptoms were more often asked for their opinion by their HCP. Due to the large number of comparisons, clearly caution is warranted in over-interpreting these findings.

With further reference to objective 2, the relationship between the most frequent (i.e., recurrent utterances) RIAS codes and patient perceptions of CR and their discussion are outlined in **Table 7**. Perception of greater CR endorsement, and greater intentions to enroll were significantly associated with discussions where HCPs more often requested their opinion. Moreover, conversations where HCPs more often asked their opinion, were associated with perceptions by patients of greater involvement as an equal partner in decision-making about illness management, greater encouragement to go to a class to help manage their cardiovascular disease, and more conveyance that their health behavior will influence their condition. Finally, the latter perception was also related to greater medical/therapeutic counseling by the HCP.

The final aspect of objective 2 is shown in **Table 8**, where the relationship between the most frequent RIAS utterances and HCP characteristics is displayed. HCP type was associated with giving more therapeutic information to patients, patient showing agreement and understanding, HCP reassurance and optimism, and interactivity. No other significant associations were observed, including HCP level of education.

With regard to objective 3, elements of the patient-HCP discussion that are related to patient referral are shown in the manuscript (**Table 3**). A similar approach was

undertaken herein to relate the RIAS codes to CR enrollment (**Table 9**). With regard to HCP utterances, there are greater CR enrollment provided less reassurance and optimism to patients and where patients asked questions regarding their lifestyle. Greater patient enrollment was significantly related to less HCP reassurance and optimism, and more patient questions about lifestyle.

With regard to objective 4, patient-HCP communication regarding CR was not analyzed by the type of HCP (i.e., nursing, allied health, physician). We are unable to undertake this analysis, due to the nested nature of the data (i.e., the same HCPs interacting with multiple patients) and the small sample size which precludes analysis using, generalized estimating equations which could take into account the nested nature of the data (i.e., intra-class correlation). Most of the HCPs were nurses or nurse-practitioners, and thus the findings herein are likely only generalizable to patient-nurse communication. Future research would be required with a larger sample of physicians and allied health professionals to adequately address this objective.

Finally, with regard to the secondary objective 5, it was evaluated whether providing tools to HCPs can promote better communication and CR use. During the latter interventional phase, HCPs were given tools (e.g., CR pamphlet [Appendix F], motivational letter signed by an expert [Appendix G], patient discharge contract [Appendix I], and discussion with previous CR graduate working through volunteer services telephone script [Appendix H]) designed to promote communication about CR. As described in **Table 10**, most (54.0%) discussions were facilitated by one tool, namely

a CR program pamphlet and motivational letter signed by the medical director of the CR program from the same institution. As also shown, there was no significant relationship between tool use and CR referral or enrollment, although extreme caution is warranted in drawing conclusions from this data based on the small cell sizes. Due to the unequal cell sizes as well, it is not possible to test for differences in RIAS codes by use of each tool (yes/no). Again, a future study would be needed to test the impact of these tools on patient-HCP communication, and ultimately CR utilization.

Extended Discussion

While replication is warranted following an exploratory study, this is the first study to have examined the nature of patient-HCP communication and how they relate to CR referral and enrollment. The discussions most-often consisted of nurses and patients sharing information about their care, and showing understanding and agreement. Most patients were highly satisfied with the quality of their interactions, CR was discussed and they were provided a program pamphlet to take home. Overall, most patients were ultimately referred and enrolled in CR. Greater rates of CR referral were related to greater interactivity and less patient concern and worry. Greater rates of CR enrollment were related to HCPs expressing less reassurance and optimism throughout their discussions and patient's questions around lifestyle.

Reasons for low CR enrollment are multi-factorial,(57) but in an effort to overcome these barriers, numerous strategies have been developed and show promise in increasing CR enrollment.(12) Patient navigators, for instance, are lay individuals who assist patients through the health care system. Much of the research within the field of

patient navigators began with cancer patients. Trained oncology nurses would provide patients and their families with support throughout their cancer journey by advocating, educating, and linking them with a network of professionals. However, they may also improve patient's transition from the inpatient setting through to accessing an outpatient CR program. In a randomized control study, Scott et al., (71) examined the effect of navigators on patient awareness of and enrollment in CR following a cardiac event or procedure. One hundred eighty- one eligible and consented patients were assigned to either a patient navigation intervention group or usual care prior to hospital discharge. Participants in the patient navigation intervention group were almost six-times more likely to have at least some awareness of CR versus the usual care group. Furthermore, participants who reported at least some CR awareness were nine- times more likely to enroll in CR.(71) In our study, patients were not significantly more likely to enroll in CR after interacting with a patient navigator. However, the number of patients who interacted with a patient navigator was particularly low and a larger sample size is required for further testing.

Future research is needed to learn to what degree optimizing patient-HCP communication at the bedside can augment CR utilization, and hence that more intervention research in this line of work is warranted. If warranted, it should first be tested whether nurse reassurance and patient questions around lifestyle are robustly related to patient enrollment, and the size of this effect. Interventions to promote such communication by nurses with patients should be developed, standardized and rigorously evaluated to see if greater rates of enrollment can be achieved. Finally, as outlined above,

some of the objectives of the thesis were not able to be tested due to limited sample size primarily. In particular it would be interesting to compare the nature of CR discussions between physicians (who can refer) and patients, than what was observed herein between nurses and patients.

As mentioned previously, our study is limited by generalizability and may not be representative of the population (e.g., first-generation immigrants). Specifically, all of our patients were fluent in English and majority were “white/ Caucasian”. In 2011, the National Household Survey, (72) indicated that 49.1% of Toronto's population is composed of visible minorities. The top ethnic origins, either alone or in combination of other origins, reported were: Chinese, East Indian and English. Combined, South Asians, Chinese and Blacks, are the three largest visible minority groups in 2011 in Canada, accounting for 61.3% of the visible minority population. They were followed by Filipinos, Latin Americans, Arabs, Southeast Asians, West Asians, Koreans and Japanese. Among the immigrants whose mother language was other than English or French, Chinese languages were most common.(72) It has demonstrated that South Asians living abroad including North America are at increased risk for developing CAD and its adverse outcomes including myocardial infarction, complications, and death. (5) In addition, metabolic syndrome and type 2 diabetes are more predominant among this population. Future research should include patients from these high-risk minority groups, and confirm these findings in a larger sample of ethno-culturally diverse patients.

The use of an interventional tool may promote discussion regarding CR at the bedside, through either serving as a cue to discuss CR, by supporting HCPs who may not

be very familiar with CR to convey information about what patients can expect, and also to serve as a cue to patients post-discharge about the importance of CR. Providing patients with a theory-based motivational letter and program pamphlet could also facilitate “endorsement-type” utterances to patients. Indeed, our lab has been collaborating with a group in Calgary to develop comprehensible print inpatient education materials regarding CR, using a “user-testing” approach.(77)

Reflections

My experience as a graduate student has given me the opportunity to experience the healthcare system from a different perspective. This exploratory research study, although limited, has raised multiple concerns regarding patient-HCP communication regarding CR. Further consideration is required of the variation in the quality of the interactions and in patient-centered care (i.e., as a component of overall quality of care). Another important issue to consider is ethno- cultural diversity (i.e., religion, ethnicity, and cultural norms) of the patients and the HCPs. This may have an impact on the patient-HCP interaction, especially while promoting and encouraging secondary prevention program such as CR participation.

In conclusion, vast under-utilization of CR despite evidence supporting referral persists. The reasons for the disparity between evidence and care are complex but, arguably there is little understanding of the nature of the discussions with patients and how they might be optimized to maximize patient CR enrollment rates. This thesis has

preliminarily identified some elements of patient-HCP discussion that, could they be optimized, may promote greater use of CR.

References

1. World Health Organization. Cardiovascular Diseases. 2012. Available from:
<http://www.who.int/mediacentre/factsheets/fs317/en/index.html>
2. Statistics Canada. Mortality: Summary List of Causes. 2008.
3. Canada Heart and Stroke Foundation. Cardiovascular Disease. 2012. Available from:
<http://www.heartandstroke.com/site/c.ikIQLcMWJtE/b.3483991/k.34A8/Statistics.htm#deaths>
4. Roger VL, Go AS, Lloyd-Jones DM, Benjamin EJ, Berry JD, Borden WB, et al. Heart disease and stroke statistics -- 2012 update: A report from the American Heart Association. *Circulation*. 2012;125(1):e2–e220
5. Bainey KR, Jugdutt BI. Increased burden of coronary artery disease in South-Asians living in North America. Need for an aggressive management algorithm. *Atherosclerosis*. 2009;204:1–10.
6. Anand SS, Yusuf S, Vuksan V, Devanese S, Teo KK, Montague PA, et al. Differences in risk factors, atherosclerosis and cardiovascular disease between ethnic groups in Canada: the study of health assessment and risk in ethnic groups. *Indian Heart J*. 2013;52:S35–43.

7. Yusuf S, Reddy S, Ounpuu S, Anand S. Global Burden of Cardiovascular Diseases: Part I: General Considerations, the Epidemiologic Transition, Risk Factors, and Impact of Urbanization. *Circulation*. 2001;104(22):2746–53.
8. Manuel DG, Leung M, Nguyen K, Tanuseputro P, Johansen H. Burden of cardiovascular disease in Canada. *Can J Cardiol*. 2003;19(9):997–1004.
9. Brown A, Taylor R, Noorani H, Stone J SBE. Exercise-based cardiac rehabilitation programs for coronary artery disease: A systematic clinical and economic review. Canadian Coordinating Office for Health Technology Assessment. Ottawa; 2003;(34).
10. Stone JA, Cyr C, Friesen M, Kennedy-Symonds H, Stene R, Smilovitch M. Canadian guidelines for cardiac rehabilitation and atherosclerotic heart disease prevention: A summary. *Can J Cardiol*. 2001;17B:3B–30B.
11. Cardiac Rehabilitation Definition.. Canadian Association of Cardiac Rehabilitation. 2012. Available from: <http://www.cacr.ca/about/definitions.cfm>
12. Davies P, Taylor F, Beswick A, Wise F, Moxham T, Rees K, et al. Promoting patient uptake and adherence in cardiac rehabilitation. *Cochrane Database Syst Rev*. 2010;CD007131.
13. Yates BC, Braklow-Whitton JL, Agrawal S. Outcomes of cardiac rehabilitation participants and nonparticipants in a rural area. *Rehabil Nurs*. 2003;28(2):57–63.

14. Thomas RJ, King M, Lui K, Oldridge N, Piña IL, Spertus J.
AACVPR/ACCF/AHA 2010 Update: Performance Measures on Cardiac
Rehabilitation for Referral to Cardiac Rehabilitation/Secondary Prevention
Services Endorsed by the American College of Chest Physicians, the American
College of Sports Medicine, the American Physical Therapy Association, the
Canadian Association of Cardiac Rehabilitation, the Clinical Exercise Physiology
Association, the European Association for Cardiovascular Prevention and
Rehabilitation, the Inter-American Heart Foundation, the National Association of
Clinical Nurse Specialists, the Preventive Cardiovascular Nurses Association, and
the Society of Thoracic Surgeons . J Am Coll Cardiol. 2010;56(14):1159–67.
15. Grace SL, Abbey SE, Shnek ZM, Irvine J, Franche RL, Stewart DE. Cardiac
rehabilitation II: Referral and participation. Gen Hosp Psychiatry. 2002;24(3):127–
34.
16. Gravely-Witte S, Leung YW, Nariani R, Tamim H, Oh P, Chan VM, Grace SL.
Effects of cardiac rehabilitation referral strategies on referral and enrollment rates.
Nat Rev Cardiol. 2010;7(2):87–96.
17. Ades PA. Cardiac rehabilitation and secondary prevention of coronary heart
disease. The New England Journal of Medicine. 2001;345(12):892–902.

18. Tsui CK-Y, Shanmugasagaram S, Jamnik V, Wu G, Grace SL. Variation in patient perceptions of healthcare provider endorsement of cardiac rehabilitation. *J Cardiopulm Rehabil Prev*. 2012;32(4):192–7.
19. Canada Heart and Stroke Foundation. Growing burden of heart disease and stroke in Canada. 2003 p. 76. Available from:
http://www.cvdinfobase.ca/cvdbook/CVD_En03.pdf
20. National Library of Medicine. Stroke: Cerebrovascular Disease. 2012. Available from: <http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001740/>
21. Furie KL, Kasner SE, Adams RJ, Albers GW, Bush RL, Fagan SC, et al. Guidelines for the prevention of stroke in patients with stroke or transient ischemic attack: A guideline for healthcare professionals from the american heart association/american stroke association. *Stroke*. 2011;42(1):227–76.
22. Health P. Transient Ischemic Attack Definition. American Accreditation HealthCare Commission. 2012. Available from:
<http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001743>
23. Prior PL, Hachinski V, Unsworth K, Chan R, Mytka S, O’Callaghan C, et al. Comprehensive cardiac rehabilitation for secondary prevention after transient

ischemic attack or mild stroke: I: Feasibility and risk factors. *Stroke*.

2011;42(11):3207–13.

24. Sacco RL, Adams R, Albers G, Alberts MJ, Benavente O, Furie K, et al. Guidelines for Prevention of Stroke in Patients With Ischemic Stroke or Transient Ischemic Attack A Statement for Healthcare Professionals From the American Heart Association/American Stroke Association Council on Stroke: Co-Sponsored by the Council on Cardiovascular Radiology and Intervention: The American Academy of Neurology affirms the value of this guideline. *Stroke*. 2006;37(2):577–617.
25. Lennon O, Carey A, Gaffney N, Stephenson J, Blake C. A pilot randomized controlled trial to evaluate the benefit of the cardiac rehabilitation paradigm for the non-acute ischaemic stroke population. *Clin Rehabil*. 2008;22(2):125–33.
26. Tang A, Marzolini S, Oh P, McIlroy WE, Brooks D. Feasibility and effects of adapted cardiac rehabilitation after stroke: A prospective trial. *BMC Neurol*. 2010;10:40.
- 267 Marzolini S, McIlroy W, Oh P, Brooks D. Can individuals participating in cardiac rehabilitation achieve recommended exercise training levels following stroke? *J Cardiopulm Rehabil Prev*. 2012;32(3):127–34.
28. Pyörälä K, De Backer G, Graham I, Poole-Wilson P, Wood D. Prevention of coronary heart disease in clinical practice: recommendations of the Task Force of

- the European Society of Cardiology, European Atherosclerosis Society and European Society of Hypertension. *Eur Heart J.* 1994;(10):1300-31.
29. Stone JA, Arthur HM, Suskin N, Austford L, Carlson J, Cupper L, et al. Canadian Guidelines for Cardiac Rehabilitation and Cardiovascular Disease Prevention: Translating Knowledge into Action (3rd ed). Winnipeg, Manitoba, Canada: Canadian Association of Cardiac Rehabilitation; 2009.
 30. Smith SC, Benjamin EJ, Bonow RO, Braun LT, Creager MA, Franklin BA, et al. AHA/ACCF Secondary Prevention and Risk Reduction Therapy for Patients with Coronary and other Atherosclerotic Vascular Disease: 2011 update: A guideline from the American Heart Association and American College of Cardiology Foundation. *Circulation.* 2011;124(22):2458–73.
 31. Polyzotis PA, Tan Y, Prior PL, Oh P, Fair T, Grace SL. Cardiac rehabilitation services in Ontario: components, models and underserved groups. *J Cardiovasc Med.* 2012;13(11):727–34.
 32. Alter DA, Oh PI, Chong A. Relationship between cardiac rehabilitation and survival after acute cardiac hospitalization within a universal health care system. *Eur J Cardiovasc Prev Rehabil.* 2009;16(1):102–13.
 33. Boulay P, Prud'homme D. Health-care consumption and recurrent myocardial infarction after 1 year of conventional treatment versus short- and long-term cardiac rehabilitation. *Prev Med.* 2004;38(5):586–93.

34. Digenio AG, Joughin HM. Should all cardiac patients be offered the choice of cardiac rehabilitation? *S Afr Med J*. 1997;87 Suppl 3:C136–44.
35. Jolliffe JA, Rees K, Taylor RS, Thompson D, Oldridge N, Ebrahim S. Exercise-based rehabilitation for coronary heart disease. *Cochrane Database Syst Rev*. 2001;(1):CD001800.
36. Lavie CJ, Milani R V. Adverse psychological and coronary risk profiles in young patients with coronary artery disease and benefits of formal cardiac rehabilitation. *Arch Intern Med*. 2006;166(17):1878–83.
37. Lavie CJ, Milani R V. Prevalence of anxiety in coronary patients with improvement following cardiac rehabilitation and exercise training. *Am J Cardiol*. 2004;93(3):336–9.
38. Taylor RS, Brown A, Ebrahim S, Jolliffe J, Noorani H, Rees K, Skidmore B, Stone JA, Thompson DR, Oldridge N. Exercise-based rehabilitation for patients with coronary heart disease: Systematic review and meta-analysis of randomized controlled trials. *Am J Med*. 2004;116(10):682–92.
39. Heran BS, Chen JM, Ebrahim S, Moxham T, Oldridge N, Rees K, Thompson DR, Taylor RS. Exercise-based cardiac rehabilitation for coronary heart disease. *Cochrane Database Syst Rev*. 2011;(7):91.

40. DeJong A. Cardiac Rehabilitation: Underutilized Care Offering Substantial Benefits. *ACSM's Health & Fitness Journal*. 2012;16(2):31–3.
41. Thompson DR, Bowman GS. Evidence for the effectiveness of cardiac rehabilitation. *Intensive Crit Care Nurs*. 1998;14(1):38–48.
42. Taylor RS, Brown A, Ebrahim S, Jolliffe J, Noorani H, Rees K, et al. Exercise-based rehabilitation for patients with coronary heart disease: Systematic review and meta-analysis of randomized controlled trials. *Am J Med*. 2004;116(10):682–92.
43. Clark AM, Hartling L, Vandermeer B, McAlister FA. Meta-analysis: secondary prevention programs for patients with coronary artery disease. *Ann Intern Med*. 2005;143(9):659–72.
44. Hedbäck B, Perk J, Hörnblad M, Ohlsson U. Cardiac rehabilitation after coronary artery bypass surgery: 10-year results on mortality, morbidity and readmissions to hospital. *J Cardiovasc Risk*. 2001;8(3):153–8.
45. Ades PA, Waldmann ML, McCann WJ, Weaver SO. Predictors of cardiac rehabilitation participation in older coronary patients. *Arch Intern Med*. 1992;152(5):1033–5.

46. Pasquali SK, Alexander KP, Lytle BL, Coombs LP, Peterson ED. Testing an intervention to increase cardiac rehabilitation enrollment after coronary artery bypass grafting. *Am J Cardiol*. 2001;88(12):1415–6, A6.
47. Scott LB. Referral to outpatient cardiac rehabilitation: Intervention research at the patient, provider, and health system levels. *Nat Clin Pract Cardiovasc Med*. 2008;5(10):671–2.
43. Suaya JA, Shepard DS, Normand S-LT, Ades P a, Prottas J, Stason WB. Use of cardiac rehabilitation by Medicare beneficiaries after myocardial infarction or coronary bypass surgery. *Circulation*. 2007;116(15):1653–62.
48. Kotseva K, Wood D, De Backer G, De Bacquer D. Use and effects of cardiac rehabilitation in patients with coronary heart disease: Results from the EUROASPIRE III survey. *Eur J Prev Cardiol*. 2012.
49. Witt BJ, Thomas RJ, Roger VL. Cardiac rehabilitation after myocardial infarction: a review to understand barriers to participation and potential solutions. *Europa Medicophysica*. 2005;41(1):27–34.
50. Daly J, Sindone AP, Thompson DR, Hancock K, Chang E, Davidson P. Barriers to participation in and adherence to cardiac rehabilitation programs: a critical literature review. *Prog Cardiovasc Nurs*. 2002;17(1):8–17.

51. Shanmugasagaram S, Gagliese L, Oh P, Stewart DE, Brister SJ, Chan V, et al. Psychometric validation of the cardiac rehabilitation barriers scale. *Clinic Rehabil.* 2012;26(2):152–64.
52. Cooper AF, Jackson G, Weinman J, Horne R. Factors associated with cardiac rehabilitation attendance: A systematic review of the literature. *Clinical Rehabilitation.* 2002;16(5):541–52.
53. Grace SL, Evindar A, Abramson BL, Stewart DE. Physician management preferences for cardiac patients: Factors affecting referral to cardiac rehabilitation. *The Canadian Journal of Cardiology.* 2004;20(11):1101–7.
54. Guyatt GH, Oxman AD, Vist GE, Kunz R, Falck-Ytter Y, Alonso-Coello P, et al. GRADE: An emerging consensus on rating quality of evidence and strength of recommendations. *British Medical Journal.* 2008;336(7650):924–6.
55. Grace SL, Chessex C, Arthur H, Chan S, Cyr C, Dafoe W, et al. Systematizing inpatient referral to cardiac rehabilitation 2010: Canadian Association of Cardiac Rehabilitation and Canadian Cardiovascular Society joint position paper endorsed by the Cardiac Care Network of Ontario. *Can J Cardiol.* 2011;27(2):192–9.

56. Grace SL, Russell KL, Reid RD, Oh P, Anand S, Rush J, et al. Effect of cardiac rehabilitation referral strategies on utilization rates: A prospective, controlled study. *Arch Intern Med*. 2011;171(3):235–41. 4
57. Grace SL, Angevaere KL, Reid RD, Oh P, Anand S, Gupta M, et al. Effectiveness of inpatient and outpatient strategies in increasing referral and utilization of cardiac rehabilitation: A prospective, multi-site study. *Implement Sci*. 2012;7(1):120.
58. Shanks LC, Moore SM, Zeller RA. Predictors of cardiac rehabilitation initiation. *Rehabil Nurs*. 2007;32(4):152–7.
59. Bernhardt JM. Communication at the core of effective public health. *Am J Public Health*. 2004;94(12):2051–3. A
60. David M. Lawrence, James W. Holsinger, Jr. FDS. *Contemporary Public Health: Principles, Practice, and Policy*. The University Press of Kentucky; 2013.
61. Kripalani S, LeFevre F, Phillips CO, Williams M V, Basaviah P, Baker DW. Deficits in communication and information transfer between hospital-based and primary care physicians: implications for patient safety and continuity of care. *JAMA*. 2007;297(8):831–41.
62. Snow V, Beck D, Budnitz T, Miller DC, Potter J, Wears RL, et al. Transitions of Care Consensus policy statement: American College of Physicians, Society of

General Internal Medicine, Society of Hospital Medicine, American Geriatrics Society, American College Of Emergency Physicians, and Society for Academic Emergency Medicine. *J Gen Intern Med*. 2009;4(6):364–70.

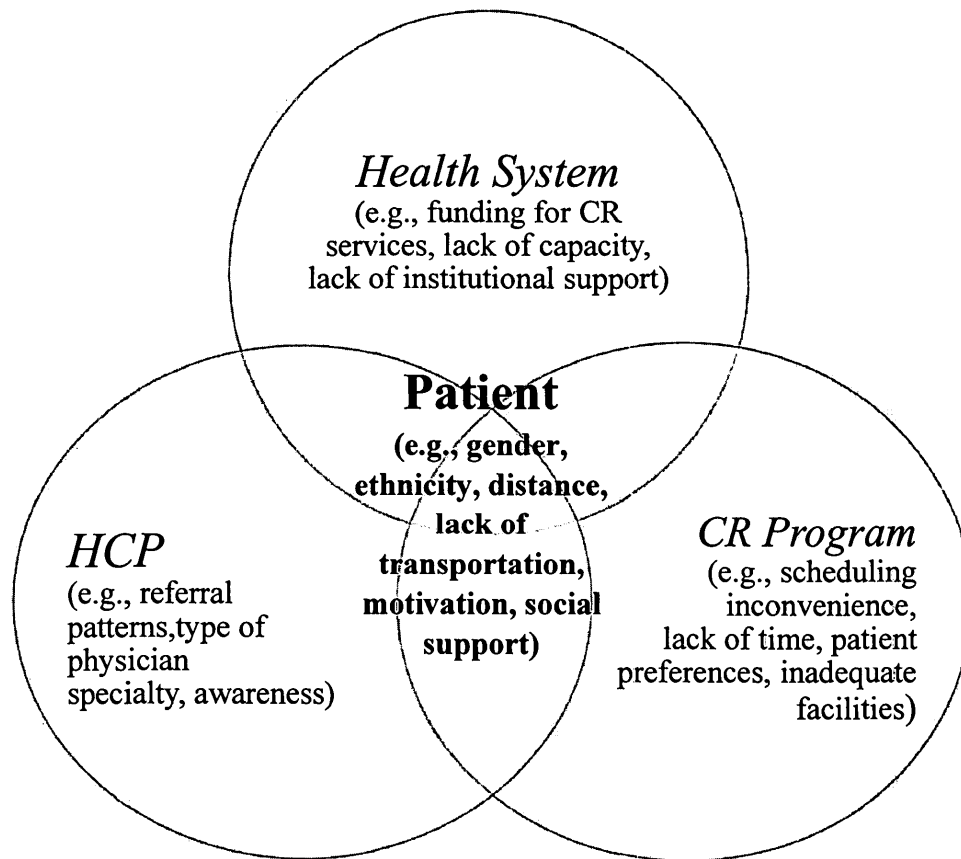
63. Wanzer MB, Booth-Butterfield M, Gruber K. Perceptions of health care providers' communication: Relationships between patient-centered communication and satisfaction. *Health Commun*. 2004;16(3):363–83.
64. Wakefield BJ, Bylund CL, Holman JE, Ray A, Scherubel M, Kienzle MG, et al. Nurse and patient communication profiles in a home-based telehealth intervention for heart failure management. *Patient Educ Couns*. 2008;71(2):285–92.
65. Gilbert DA, Hayes E. Communication and outcomes of visits between older patients and nurse practitioners. *Nurs Res*. 2010;58(4):283–93.
66. Roter D, Larson S. The Roter interaction analysis system (RIAS): Utility and flexibility for analysis of medical interactions. *Patient Educ Couns*. 2002;46(4):243–51.
67. Sonntag U, Henkel J, Renneberg B, Bockelbrink A, Braun V, Heintze C. Counseling overweight patients: Analysis of preventive encounters in primary care. *Int J Qual Health Care*. 2010;22(6):486–92.
68. Cooper LA, Roter DL, Bone LR, Larson SM, Miller ER, Barr MS, Carson KA, Levine DM. A randomized controlled trial of interventions to enhance

patient-physician partnership, patient adherence and high blood pressure control among ethnic minorities and poor persons. *Implement Sci.* 2009;4:7.

69. Johnson RL, Roter D, Powe NR, Cooper LA. Patient race/ethnicity and quality of patient-physician communication during medical visits. *Am J Public Health.* 2004;94(12):2084–90.
70. Van Weert J, Van Dulmen S, Bär P, Venus E. Interdisciplinary preoperative patient education in cardiac surgery. *Patient Educ Couns.* 2003;49(2):105–14.
71. Scott LB, Gravely S, Sexton TR, Brzostek S, Brown DL. Examining the Effect of a Patient Navigation Intervention on Outpatient Cardiac Rehabilitation Awareness and Enrollment. *J Cardiopulm Rehabil Prev.* 2013;33(5):281–91.
72. Census Canada. National Household Survey: Immigration and Ethnocultural Diversity in Canada. 2011. Available from: <http://www12.statcan.gc.ca/nhs-enm/2011/as-sa/99-010-x/99-010-x2011001-eng.cfm#a>
73. Ades PA, Pashkow FJ, Nestor JR. Cost-effectiveness of cardiac rehabilitation after myocardial infarction. *J Cardiopulm Rehabil.* 2013;17(4):222–31.
74. Oldridge N, Furlong W, Feeny D, Torrance G, Guyatt G, Crowe J, et al. Economic evaluation of cardiac rehabilitation soon after acute myocardial infarction. *Am J Cardiol.* 1993;72(2):154–61.

75. Oldridge N, Furlong W, Perkins A, Feeny D, Torrance GW. Community or patient preferences for cost-effectiveness of cardiac rehabilitation: does it matter? *Eur J Cardiovasc Prev Rehabil*. 2008;15(5):608–15.
76. Levin LA, Perk J, Hedbäck B. Cardiac rehabilitation--a cost analysis. *J Intern Med*. 1991;230(5):427–34.
77. Martin, Billie-Jean, Trina Hauer, Ross Arena, Leslie Austford, James A Stone, Sherry L. Grace SA. Developing Comprehensible Print Inpatient Education Material for Cardiac Rehabilitation: A User-Testing Approach. 2013.

Figure 2. Multifactorial Barriers to Cardiovascular Rehabilitation



Note: CR; Cardiovascular Rehabilitation; HCP, Healthcare Provider

Table 5. Findings from Investigator-Generated CR-Specific Coding of Patient-HCP Discussions, N=50

Codes	N (%)
Was CR mentioned at any point during the patient-HCP discussion? (% yes)	41 (82.0%)
Who initiated the conversation about CR? (% HCP)	41 (82.0%)
Was the exchange a 2-way discussion? (% yes)	29 (58.0%)
Was a referral to CR discussed? (% yes)	35 (70.0%)
Did the HCP endorse/encourage patient participation in CR? (% yes)	40 (80.0%)
Were barriers to CR mentioned? (% yes)	11 (22.0%)

Note: CR- Cardiovascular Rehabilitation; HCP- Healthcare Provider

Table 6. Relationship Between Select Interaction Analysis Utterances and Sociodemographic and Clinical Characteristics of Patients, N=50

	Select RIAS Utterances								
	HCP: Gives information- therapeutic	Pt: Shows agreement, understanding	HCP: Counsels- medical/ therapeutic	HCP: Shows agreement, understanding	Pt: Gives information- lifestyle	HCP: Back- channels	HCP: Reassures, optimism	HCP: Asks for opinion	HCP: Interactivity
Sociodemographic									
Age, years (mean \pm SD)	0.40	<0.05	0.54	0.78	0.67	0.71	0.65	0.15	0.80
Sex (% female)	0.15	0.06	0.77	0.10	0.10	<0.05	0.16	0.19	0.24
Marital Status (% married)	0.45	0.97	0.50	0.18	<0.05	<0.05	0.61	0.51	0.57
Ethnicity (% white/Caucasian)	0.49	0.77	0.39	0.65	<0.05	0.43	0.86	0.20	0.82
Work Status (% retired)	0.75	0.86	0.35	0.35	0.90	0.92	0.75	0.33	0.62
Education (% post-secondary)	0.83	0.91	0.82	<0.05	0.48	0.54	0.39	0.54	0.48
Subjective SES/10 (mean \pm SD)	0.91	0.69	0.94	0.12	0.96	0.37	<0.05	0.25	0.92
Clinical									
CR Indication									
PCI (% yes)	0.22	0.31	0.66	0.09	0.37	<0.05	0.16	0.37	0.55
Stroke (% yes)	0.96	0.86	0.08	0.49	0.38	0.78	0.07	<0.05	<0.05
HF (% yes)	0.88	0.81	0.75	<0.05	0.96	0.29	0.56	0.70	0.34
MI (% yes)	0.66	0.93	0.97	0.23	0.16	0.15	0.37	0.92	0.13
BMI (mean \pm SD)	0.49	0.22	0.39	0.70	0.19	0.09	<0.05	0.58	0.45
Diabetes (% yes)	0.40	0.76	0.88	0.99	0.97	0.54	0.44	0.26	0.78
Hypertension (% yes)	0.88	0.80	0.89	0.81	0.10	0.51	<0.05	0.93	0.46
Dyslipidemia (% yes)	0.80	0.67	0.38	0.32	0.17	<0.05	0.19	0.31	0.43
Previous CAD (% yes)	0.66	0.39	0.21	0.88	0.87	0.30	0.62	0.27	0.53
DASI (mean \pm SD)	<0.05	<0.05	<0.05	0.44	0.53	0.91	0.97	0.59	0.07
PHQ-1 /3, (mean \pm SD)	0.89	0.68	0.65	0.92	0.85	0.45	0.48	0.25	0.54
PHQ-2 /3, (mean \pm SD)	0.89	0.55	0.87	0.60	0.89	0.53	0.61	<0.05	0.79

Note: SES, Subjective Socioeconomic Status; PCI, Percutaneous Coronary Intervention; HF, Heart Failure; MI, Myocardial Infarction; BMI, Body mass index; CAD, Coronary Artery Disease; DASI, Duke Activity Status Index; CR, Cardiovascular Rehabilitation; HCP, Healthcare provider; Pt, Patient; PHQ-1, Patient Health Questionnaire item 1- How often bothered by little interest or pleasure in doing things?; PHQ-2, Patient Health Questionnaire item 2- How often bothered by feeling down, hopeless and depressed?; SD, Standard Deviation; RIAS, Roter Interaction Analysis System

*Spearman correlation or Mann-Whitney U p-values reported, as applicable.

Table 7. Relationship Between Select RIAS Utterances and Patient Perception of CR as well as of Discussion with HCP, N=50

	Select RIAS Utterances								
	HCP: Gives information-therapeutic	Pt: Shows agreement, understanding	HCP: Counsels-medical/therapeutic	HCP: Shows agreement, understanding	Pt: Gives information-lifestyle	HCP: Back-channels	HCP: Reassures, optimism	HCP: Asks for opinion	HCP: Interactivity
Patient Perception of CR									
Perceived strength of CR endorsement	0.84	0.87	0.45	0.70	0.43	0.92	0.07	<0.05	0.61
Perceives they will be referred	0.81	0.40	0.43	0.31	0.80	0.47	0.88	0.16	0.59
Intention to enroll	0.42	0.23	0.68	0.92	0.51	0.67	0.23	<0.05	0.42
CR awareness	0.68	0.99	0.83	0.99	0.82	0.87	0.73	0.67	0.61
Previous CR participation	0.31	0.61	0.28	0.39	0.17	0.12	0.92	0.46	0.37
HCP- Patient Audiorecording Experience									
Did your healthcare provider involve you as an equal partner in making decisions about illness management strategies and goals?	0.57	0.45	0.31	0.53	0.72	0.52	0.75	<0.01	0.51
Did your healthcare provider listen carefully to what you had to say about your illness?	0.49	0.19	0.14	0.59	0.77	0.87	0.30	0.07	0.48
Did your healthcare provider encourage you to go to a specific group or class to help you manage your health condition?	0.08	0.10	0.15	0.55	0.49	0.74	0.36	<0.05	0.41
Did your healthcare provider convey that what you should do to take care of yourself influences your health condition?	0.23	0.16	<0.01	0.54	0.90	0.91	0.48	<0.01	0.07
Patient-centeredness of interaction	0.16	0.08	0.43	0.53	0.22	0.72	0.09	0.10	0.54
Family present during audiorecorded discussion	0.39	0.73	0.73	0.88	0.51	0.61	0.39	0.81	0.93

Note: CR- Cardiac Rehabilitation; HCP- Healthcare Provider; Pt- Patient

* Spearman correlation or Mann-Whitney U p-values reported, as applicable

Table 8. The relationship between Select RIAS Utterances and HCP characteristics, Attitudes and Perceptions, N=26

	Select RIAS Utterances							HCP: Asks for opinion	HCP: Interactivity
	HCP: Gives information- therapeutic	Pt: Shows agreement, understanding	HCP: Counsels- medical/ therapeutic	HCP: Shows agreement, understanding	Pt: Gives information- lifestyle	HCP: Back- channels	HCP: Reassures, optimism		
Sex (% female)	0.31	0.37	0.40	0.82	0.12	0.21	0.98	0.19	0.54
Highest Degree Obtained (% undergraduate degree)	0.30	0.88	0.36	0.72	0.45	0.30	0.81	0.75	0.96
Year obtained highest academic qualification	0.61	0.66	0.99	0.64	0.16	0.20	0.82	0.27	0.23
Profession (% nurse)	<0.05	<0.05	0.20	0.14	0.34	0.09	<0.05	0.09	<0.05
Estimated number of patients seen/day	0.85	0.31	0.71	0.78	0.68	0.38	0.20	0.86	0.71

Note: Pt- Patient; HCP- Healthcare Provider

* Spearman correlation or Mann-Whitney U test p-values reported, as applicable

Table 9. Mean Frequency (\pm standard deviation) of Discussion Elements and Global Affect Ratings* by CR Enrollment, in Descending Order

Code	CR Enrollment			<i>p</i>
	Total N=50	Enrolled in CR N=27 (54.0%)	Not Enrolled in CR N=23 (46.0%)	
HCP: Gives information- therapeutic	38.58 \pm 36.97	39.22 \pm 26.72	37.39 \pm 46.88	0.12
Pt: Shows agreement, understanding	33.20 \pm 29.44	34.48 \pm 26.10	31.70 \pm 33.47	0.34
HCP: Counsels- medical/therapeutic	14.20 \pm 19.98	14.26 \pm 18.89	14.13 \pm 21.61	0.71
HCP: Shows agreement, understanding	11.94 \pm 12.81	10.89 \pm 7.91	13.17 \pm 16.99	0.64
Pt: Gives information- lifestyle	10.16 \pm 12.84	7.26 \pm 8.36	13.57 \pm 16.18	0.15
HCP: Back-channels	9.84 \pm 9.10	8.44 \pm 9.09	11.48 \pm 9.03	0.11
Pt: Gives information- medical	8.86 \pm 12.50	7.93 \pm 12.28	9.96 \pm 12.93	0.24
Pt: Gives information- therapeutic	8.10 \pm 8.15	6.78 \pm 6.46	9.65 \pm 9.70	0.29
HCP: Counsels- lifestyle/ psychosocial	6.82 \pm 17.38	8.78 \pm 22.40	4.52 \pm 8.31	0.98
HCP: Paraphrase, checks for understanding	6.52 \pm 9.36	4.48 \pm 4.37	8.91 \pm 12.71	0.17
HCP: Gives information- medical	6.28 \pm 10.41	5.70 \pm 7.10	6.96 \pm 13.46	0.93
HCP: Gives information- lifestyle	5.82 \pm 7.44	5.96 \pm 6.12	5.65 \pm 8.89	0.17
HCP: Reassures, optimism	5.32 \pm 6.52	3.44 \pm 3.66	7.52 \pm 8.34	<0.05
HCP: Gives orientation, instructions	5.08 \pm 8.67	4.70 \pm 8.44	5.52 \pm 9.10	0.33
HCP: Interest/ attentiveness	4.62 \pm 0.60	4.56 \pm 0.70	4.70 \pm 0.47	0.64
HCP: Asks for understanding	4.50 \pm 6.53	5.41 \pm 7.89	3.43 \pm 4.40	0.36
Pt: Interest/attentiveness	4.36 \pm 0.69	4.33 \pm 0.68	4.39 \pm 0.72	0.70
Pt: Paraphrase, checks for understanding	3.82 \pm 4.65	3.48 \pm 4.08	4.22 \pm 5.32	0.80
HCP: Friendliness/ warmth	3.82 \pm 0.69	3.74 \pm 0.66	3.91 \pm 0.73	0.41
HCP: Interactivity	3.72 \pm 0.88	3.85 \pm 0.86	3.57 \pm 0.90	0.30
Pt: Friendliness/warmth	3.72 \pm 0.70	3.59 \pm 0.69	3.87 \pm 0.69	0.15
HCP: Responsiveness/ engagement	3.70 \pm 0.84	3.78 \pm 0.85	3.61 \pm 0.84	0.54
HCP: Sympathetic/ empathetic	3.62 \pm 0.60	3.56 \pm 0.64	3.70 \pm 0.56	0.33
Pt: All questions –therapeutic	3.54 \pm 4.90	4.41 \pm 6.01	2.52 \pm 2.98	0.46
HCP: Dominance/ assertiveness	3.44 \pm 0.54	3.52 \pm 0.51	3.35 \pm 0.57	0.31
Pt: Interactivity	3.30 \pm 0.79	3.33 \pm 0.83	3.26 \pm 0.75	0.75
Pt: Responsiveness /engagement	3.28 \pm 0.70	3.30 \pm 0.67	3.26 \pm 0.75	0.88
HCP: Hurried/ rushed	3.28 \pm 1.34	3.26 \pm 1.32	3.30 \pm 1.40	0.86
Pt: Dominance/ assertiveness	3.22 \pm 0.51	3.22 \pm 0.58	3.22 \pm 0.42	0.87
HCP: Concern, worry	3.16 \pm 5.34	3.22 \pm 5.26	3.09 \pm 5.54	0.94
Pt: Reassures, optimism	3.04 \pm 2.70	2.26 \pm 1.75	3.96 \pm 3.32	0.09

HCP: Respectfulness	3.02±0.14	3.04±0.19	3.00±0.00	0.36
Pt: Respectfulness	3.00±0.29	2.96±0.34	3.04±0.21	0.32
Pt: Sympathetic/empathetic	2.98±0.14	2.96±0.19	3.00±0.00	0.36
HCP: Approval- direct	2.86±3.72	2.04±2.12	3.83±4.87	0.25
Pt: Laughs, tell jokes	2.84±4.42	2.93±4.84	2.74±3.99	0.85
HCP: Closed question- medical	2.80±4.65	2.48±4.88	3.17±4.44	0.26
HCP: Gives information- psychosocial	2.38±8.51	3.74±11.34	0.78±2.13	0.64
HCP: Closed question- lifestyle	2.18±4.22	1.89±3.12	2.52±5.28	0.82
HCP: Transitions	2.06±2.45	2.41±2.75	1.65±2.04	0.37
HCP: Closed question- therapeutic	2.04±3.14	1.74±2.44	2.39±3.83	0.48
Pt: Approval- direct	2.02±2.85	1.78±2.15	2.30±3.53	0.62
Pt: Unintelligible utterance	2.00±3.21	1.52±2.94	2.57±3.49	0.08
Pt: Gives information -psychosocial	2.00±4.38	1.59±3.02	2.48±5.62	0.36
Pt: Concern, worry	1.80±2.23	1.37±1.74	2.30±2.65	0.19
HCP: Laughs, tells jokes	1.72±2.29	1.15±1.46	2.39±2.87	0.07
HCP: Personal remarks	1.68±2.90	1.26±2.12	2.17±3.60	0.43
HCP: Asks for opinion	1.66±2.90	1.26±2.12	2.17±3.60	0.76
Pt: Anxiety/ nervousness	1.44±0.64	1.48±0.64	1.39±0.66	0.52
Pt: Personal remarks	1.14±1.97	0.89±1.58	1.43±2.35	0.45
Patient: Anger/ irritation	1.02±0.14	1.04±0.19	1.00±0.00	0.36
HCP: Anxiety/ nervousness	1.00±0.00	1.00±0.00	1.00±0.00	1.00
HCP: Anger/ irritation	1.00±0.00	1.00±0.00	1.00±0.00	1.00
Pt: Emotional distress/ upset	1.00±0.00	1.00±0.00	1.00±0.00	1.00
Pt: Depression/ sadness	1.00±0.00	1.00±0.00	1.00±0.00	1.00
Pt: Transitions	0.86±1.21	0.89±1.53	0.83±0.72	0.25
HCP: Gives information -other	0.76±2.08	0.41±0.97	1.17±2.85	0.28
HCP: Open question -medical	0.72±1.75	0.52±1.25	0.96±2.20	0.46
Pt: All questions -lifestyle	0.62±0.95	0.93±1.14	0.26±0.45	<0.05
Pt: All questions -medical	0.52±1.34	0.63±1.67	0.39±0.84	0.91
HCP: Unintelligible	0.52±0.95	0.48±0.80	0.57±1.12	0.77
Pt: Asks for understanding	0.50±0.84	0.48±0.89	0.52±0.79	0.71
Pt: Gives orientation, instructions	0.50±0.95	0.63±1.15	0.35±0.65	0.41
HCP: Open question -therapeutic	0.46±0.95	0.52±0.80	0.39±1.12	0.22
Pt: Gives information -other	0.46±1.33	0.30±0.67	0.65±1.82	0.83
Pt: Disagreement, criticism-direct	0.42±0.93	0.41±0.89	0.48±0.99	0.83
Pt: Open question -lifestyle	0.34±1.47	0.15±0.53	0.57±2.09	0.32
HCP: Closed question -other	0.32±1.08	0.22±0.58	0.43±1.47	0.83

HCP: Disagreement, criticism - direct	0.24±0.56	0.15±0.36	0.35±0.71	0.42
HCP: Self-disclosure	0.20±0.64	0.19±0.62	0.22±0.67	0.84
HCP: Asks for reassurance	0.20±0.49	0.19±0.48	0.22±0.52	0.81
HCP: Legitimation statements	0.20±0.64	0.11±0.32	0.30±0.88	0.76
Pt: Asks for reassurance	0.18±0.56	0.15±0.60	0.22±0.52	0.31
Pt: Compliment -general	0.16±0.51	0.19±0.56	0.13±0.46	0.76
Pt: All questions -psychosocial	0.16±0.62	0.26±0.81	0.04±0.21	0.36
HCP: Bid for repetition	0.14±0.53	0.11±0.58	0.17±0.49	0.26
HCP: Compliment- general	0.14±0.64	0.00±0.00	0.30±0.93	0.06
Pt: Disagreement, criticism-general	0.14±0.40	0.15±0.46	0.13±0.34	0.88
HCP: Closed question -psychosocial	0.12±0.33	0.11±0.32	0.13±0.34	0.84
HCP: Asks for permission	0.12±0.39	0.19±0.48	0.04±0.21	0.22
HCP: Open question -psychosocial	0.12±0.39	0.07±0.27	0.17±0.49	0.49
HCP: Partnership statements	0.12±0.39	0.07±0.27	0.17±0.49	0.84
Pt: All questions -other	0.10±0.36	0.07±0.38	0.13±0.34	0.26
HCP: Empathy statements	0.08±0.34	0.00±0.00	0.16±0.49	0.06
HCP: Disagreements, criticism -general	0.06±0.31	0.11±0.42	0.00±0.00	0.19
Pt: Bid for repetition	0.02±0.14	0.00±0.00	0.04±0.21	0.28

Note: Pt- Patient; HCP- Healthcare Provider

* Mann-Whitney U comparing mean frequency of RIAS utterances by CR enrollment.

** RIAS coded discussion elements not mentioned includes: Pt: Asks for service; Pt: Legitimation statements; Pt: Empathy statements; HCP: Open question- other.

Table 10. CR Discussion Tool by Referral and Enrollment, N=50

Tools	27 (54.0%) Discussions used	35 (70.0%) Referred	27 (54.0%) Enrolled
(a) CR program pamphlet and motivational letter signed by the medical director of the CR program from the same institution,	25 (92.6%)	18 (72.0%)	13 (52.0%)
(c) Comprehensive patient discharge contract including CR,	4 (14.8%)	3 (75.0%)	3 (75.0%)
(d) Discussion with previous CR graduates working through Volunteer Services,	2 (7.4%)	2 (100.0%)	2 (100.0%)
(e) Phone call to patients at home.	2 (7.4%)	2 (100.0%)	2 (100.0%)

Note: CR, Cardiovascular Rehabilitation

Table 11. The Relationship Between Select RIAS Utterances and CR Pamphlet and Motivational Letter, N=50

	Select RIAS Utterances								
	HCP: Gives information- therapeutic	Pt: Shows agreement, understanding	HCP: Counsels- medical/ therapeutic	HCP: Shows agreement, understandin g	Pt: Gives information- lifestyle	HCP: Back- channels	HCP: Reassures, optimism	HCP: Asks for opinion	HCP: Interactivity
(a) CR program pamphlet and motivational letter signed by the medical director of the CR program from the same institution	0.52	0.12	0.75	0.28	0.69	<0.05	0.09	<0.05	0.80

Note: CR- Cardiovascular Rehabilitation; HCP- Healthcare Provider; Pt- Patient

*Mann-Whitney U values reported

Appendices

Appendix A: Healthcare Provider Email/Letter of Information

VRComm Study
Toronto General Hospital, EN7-235
200 Elizabeth St. Toronto, ON
M5G 2C4
(416) 340-4800 x.6593



University Health Network
Toronto General Hospital, Toronto Western Hospital, Mount Sinai Hospital

30 September 2012

RE: REQUEST TO PARTICIPATE in Heart Inpatient-Provider Interaction STUDY

Dear Cardiac Mentor:

We are writing to ask for your help in a study regarding bedside communication with cardiac inpatients. This study is part of an effort to learn about, and improve, inpatient interaction regarding secondary prevention recommendations and outpatient disease management.

We are approaching healthcare providers and cardiac mentors from the inpatient cardiac units at the University Health Network. Participation in this study involves: (1) audio recording bedside discussions with consenting patients, and (2) completion of a brief survey.

Included in this package are 2 copies of the study consent form. Please read it to learn more about the study. If you are willing to participate, you will find a place for you to sign and date on the last page. You can keep one copy for your records, and return the other copy to us via internal mail at TGH EN7-235. If you prefer not to participate, please let us know so that we cease attempting to contact you. You could do this by indicating your name on the front page of an unsigned consent form, and sending to us in internal mail.

If you have any questions about this study, we would be happy to talk with you. The study coordinator Mandy Kentner can be reached by email at akentner@uhnresearch.ca or 416 340-4800 ext. 6593#.

Thank you very much for considering this important study.

Sincerely,

Sherry L. Grace, PhD

Caroline Chessex, MD

&

Research Director,
Cardiovascular Rehabilitation
& Prevention Program
Peter Munk Cardiac Centre,
& Scientist, Toronto General Research
Institute, University Health Network

Clinical Director,
Cardiovascular Rehabilitation &
Prevention Program
Peter Munk Cardiac Centre,
Toronto Western Hospital,
University Health Network

Appendix B: Healthcare Provider Consent Form



University Health Network

CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Short Title	Heart Inpatient-Provider Interaction
Investigator	Sherry L. Grace, PhD. Scientist and Associate Professor (416) 340-4800 x. 6455#
Co-Investigators	Caroline Chessex, MD, University Health Network Tiziana Rivera, MSc, NP, York Central Hospital Sheryl Alexander, MScN, RN, University Health Network
Study Personnel	Mary Attia, BSc (Study Coordinator/Recruiter) Amanda Kentner, PhD (Study Coordinator/Recruiter) Shannon Gravely, PhD (Assistant Researcher) Yongyao Tan, MSc (Data management) Sanam Pourhabib, BSc (Graduate student/ Recruiter)
Sponsor	Canadian Institutes of Health Research
Version	3

Introduction

Before agreeing to participate in this study, it is important that you read and understand the following explanation of the proposed study procedures. The following information describes the purpose, procedures, benefits, discomforts, risks and precautions associated with this study. It also describes your right to refuse to participate or withdraw from the study at any time. In order to decide whether you wish to participate in this research study, you should understand enough about its risks and benefits to be able to make an informed decision. This is known as the informed consent process. Please ask the study staff to explain any words you don't understand before signing this consent form. Make sure all your questions have been answered to your satisfaction before signing this document.

Voluntary Participation

Your participation in this study is voluntary. You can choose not to participate, or you may withdraw at any time. There will be no penalty or implications if you refuse to participate or withdraw at any time.

Background and Purpose

- This study explores inpatient discussions with health care providers and cardiac mentors about how to manage their heart health after leaving the hospital. We want to understand how we can improve the way information about chronic disease management and care is provided to patients.
- About 50 heart patients from 2 hospitals will be in the study: University Health Network and York Central Hospital.
- You are being asked to participate because you provide patient care on the cardiac inpatient unit at one of the participating hospitals, or because you volunteer as a cardiac mentor on the cardiac unit of one of the participating hospitals.
- The length of your participation may vary dependent on the number of patient interactions that you and your patients are willing to record.

Study Procedures

If you consent to participate, the study coordinator will arrange a mutually convenient day on which you will carry a digital recorder to audiotape discussions with cardiac inpatients who consent to participate.

The day on which you agree to record, the study coordinator will approach inpatients who have agreed to learn more about the study. She will solicit written and informed consent from patients, and post a coloured sign by the patient's bed. This poster will serve as a visual cue to you that the patient agrees to audiotape your interaction.

If you agree to recording, you be asked to carry a numbered digital recorder during your interaction, and to turn it on and off at the beginning and end of each interaction. You will be requested to confirm with the patient that indeed they consented to participate in the study and to agree for the recording of dialogue to begin. The research study personnel will pick up the recorder and securely take it to the research office to be processed.

You will be instructed to call the study personnel at the end of your patient interactions, so the recorder can be picked up and securely taken to the research office to be processed.

All audio recordings of the interactions will be reviewed by study staff at Toronto General Hospital. The data manager will delete any irrelevant conversation, identifying information, and assign the interaction a number so you and the patient cannot be identified. The non-identifiable recording will be sent through a secure file portal to consultants for coding.

At the end of the day, you will be asked to fill out a brief paper-and-pencil survey. The survey will ask you about your attitudes toward outpatient chronic disease management programs. If there are any questions that you do not feel comfortable answering you may choose not to answer. The survey will take about 10 minutes to complete.

Intervention

You may be provided with an educational letter, pamphlet or form to be provided to the patient.

If you would like to receive the study results, please provide the study staff with your email address.

Eligibility

All healthcare providers and volunteers serving patients on the cardiac units are being invited to participate.

Risks Related to Being in the Study

You will be revealing your attitudes and some sociodemographic information; however, this information will remain confidential. Your interaction with patients will be recorded, but will be identifiable only by a numeric research ID number, and coding will be described in aggregate form only.

Benefits

Participating in this study will be of no benefit to you. However, information gleaned from this study may benefit other healthcare providers managing cardiac inpatients, and may improve continuity of care for cardiac outpatients.

Confidentiality

Each participant and provider will be assigned a research ID number. All digital recordings will be stripped of identifying information to remain confidential. Survey responses will also be identified by your research ID number.

All information obtained during the study will be held in strict confidence. No names or identifying information will be used in any publication or presentations. No information identifying you will be transferred outside the investigators in this study. After the data has been maintained for the mandatory storage period of 25 years, it will all be disposed of appropriately so that confidentiality is preserved.

Compensation

You will not be compensated for your participation in this study nor will there be any monetary costs to you associated with participation in this study.

Questions About the Study

If you have any questions, concerns or would like to speak to the study team for any reason, please call: Sherry Grace, PhD at 416-340-4800 x. 6455, or Mary Attia at 416-340-4800 x. 2879.

If you have any questions about your rights as a research participant or have concerns about this study, call the Chair of the University Health Network Research Ethics Board (REB) or the Research Ethics office at 416-581-7849. The REB is a group of people who oversee the ethical conduct of research studies. These people are not part of the study team. Everything that you discuss will be kept confidential.

Consent

In no way does signing this consent form waive your legal rights nor does it relieve the investigators, sponsors or involved institutions from their legal and professional responsibilities.

This study has been explained to me and any questions I had have been answered. I know that I may stop recording my interactions with patients at any time. I agree to take part in this study.

_____	_____	_____
Print Study Participant's Name	Signature	Date

(You will be given a signed copy of this consent form)

My signature means that I have explained the study to the participant named above. I have answered all questions.

_____	_____	_____
Person Obtaining Consent	Signature	Date

Appendix C: Patient Consent Form



University Health Network

CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Short Title	Heart Inpatient-Provider Interaction
Investigator	Sherry L. Grace, PhD. Scientist and Director of Research (416) 340-4800 x. 6455#
Co-Investigators	Caroline Chessex, MD, University Health Network Tiziana Rivera, MSc, NP, York Central Hospital Sheryl Alexandre, RN, MScN, University Health Network
Study Personnel	Mary Attia, BSc (Study Coordinator/Recruiter) Amanda Kentner, PhD (Study Coordinator) Shannon Gravelly, PhD (Research Assistant) Yongyao Tan, MSc (Data management) Sanam Pourhabib, BSc (Graduate student/Recruiter)
Sponsor	Canadian Institutes of Health Research

Introduction

Before agreeing to participate in this study, it is important that you read and understand the following explanation of the proposed study procedures. The following information describes the purpose, procedures, benefits, discomforts, risks and precautions associated with this study. It also describes your right to refuse to participate or withdraw from the study at any time. In order to decide whether you wish to participate in this research study, you should understand enough about its risks and benefits to be able to make an informed decision. This is known as the informed consent process. Please ask the study doctor or study staff to explain any words you don't understand before signing this consent form. Make sure all your questions have been answered to your satisfaction before signing this document.

Background and Purpose

- This study explores patient discussions with healthcare providers about how to manage their heart health after leaving the hospital. We want to understand how we can improve the way information about chronic disease management care is provided to you.
- You are being approached to consider participating in this study because you are a patient receiving cardiac care at the University Health Network.
- About 50 heart patients from 2 hospitals will be in the study. If you agree to participate, you will be one of the patients in this study recruited from University Health Network, which

includes Toronto General Hospital and Toronto Western Hospital. The other participating hospital in this study is York Central Hospital.

- Your participation would be for today, or until you are discharged home today.

Study Procedures

In this study, we would like to audiotape conversations you have with healthcare providers (such as a nurse, physician or physiotherapist) or previous heart patients who volunteer to talk to heart patients about their recovery. We have also asked the healthcare providers involved in your care if they would participate. If they agree, we provide them with a digital audio recorder to carry around for a day.

If you consent to participate, we would put up a poster in your room to let your healthcare providers on the floor know. When one of your healthcare providers that has also agreed to participate comes in to meet with you, he or she will verify that you are willing to record your bedside conversation.

If you agree to recording, your healthcare provider or yourself will be asked to carry a numbered digital recorder during your interaction, and to turn it on and off at the beginning and end of each interaction. The research study personnel will pick up the recorder and securely take it to the research office to be processed.

Audio recordings of the discussions will be reviewed by study staff at Toronto General Hospital. The data manager will delete any irrelevant conversation, and assign the interaction a number so you and the healthcare provider cannot be identified. The non-identifiable recording will be sent through a secure file portal to consultants for coding.

After your conversations are recorded with your healthcare provider, you will be given a paper-and-pencil survey to fill out. We will check with the UHN outpatient cardiac program to see if you were referred or enrolled in their program.

Treatment

We may provide the healthcare provider with a letter, pamphlet or form to discuss with you. If these materials result in better outpatient care for heart patients, we will email them to you at the end of the study.

If you would like to receive the study results, please provide the study staff with your email address.

Tests

You are asked to fill in a survey after your conversation has been recorded. You will be asked to provide some demographic and clinical information about yourself. This survey will also ask your opinion about your attitudes and

perceptions about your discussion with the healthcare provider, and any outpatient services that may have been offered to you. It will take approximately 15 minutes to complete.

Eligibility

Any heart inpatient over the age of 18 who is sufficiently proficient in the English language to provide informed consent is eligible for the study.

Risks Related to Being in the Study

There are no medical risks if you take part in this study. You will be revealing personal information about yourself; however this information will remain confidential.

Benefits to Being in the Study

You may receive direct benefit from being in this study by getting information or pamphlets about chronic disease management programs that reduce your risk of having another heart event. Your participation will also help us improve the care of cardiac patients.

Voluntary Participation

Your participation in this study is voluntary. You may decide not to be in this study, or to be in the study now and then change your mind later. You may refuse to answer any question in the survey you do not want to answer.

Your choice not to participate will not affect your care or treatment.

Confidentiality

Personal Health Information

If you agree to join this study, the study doctor and his/her study team will look at your personal health information and collect only the information they need for the study. Personal health information is any information that could be used to identify you and includes your:

- name,
- medical record number
- existing medical records, that includes description of your heart health history, the reason for your current hospital stay, your heart risk factors, how well you are functioning, and other health problems you have.

The information that is collected for the study will be kept in a locked and secure area by the study doctor for 25 years. Only the study team or the people or groups listed below will be allowed to look at your records.

The following people may come to the hospital to look at the study records and at your personal health information to check that the information collected for the study is correct and to make sure the study followed proper laws and guidelines:

- University Health Network Research Ethics Board.

All information collected during this study, including your personal health information, will be kept confidential and will not be shared with anyone outside the study unless required by law. Any information about you that is sent out of the hospital will have a code and will not show your name or address, or any information that directly identifies you. You will not be named in any reports, publications, or presentations that may come from this study.

If you decide to leave the study, the information about you that was collected before you left the study will still be used. No new information will be collected without your permission.

Compensation

You will not be paid for participation in this study.

In no way does signing this consent form waive your legal rights nor does it relieve the investigators, sponsors or involved institutions from their legal and professional responsibilities.

Questions About the Study

If you have any questions, concerns or would like to speak to the study team for any reason, please call: Mary Attia at 416-340-4800 x. 2879.

If you have any questions about your rights as a research participant or have concerns about this study, call the Chair of the University Health Network Research Ethics Board (REB) or the Research Ethics office at 416-581-7849. The REB is a group of people who oversee the ethical conduct of research studies. These people are not part of the study team. Everything that you discuss will be kept confidential.

Consent

This study has been explained to me. Any questions I had have been answered. I know that my conversation will be audiotaped and I will be asked to fill out a survey. I know that I may leave the study at any time. I agree to voluntarily take part in this study.

Print Study Participant's Name

Signature

Date

(You will be given a signed copy of this consent form)

My signature means that I have explained the study to the participant named above. I have answered all questions.

Print Name of Person Obtaining Consent

Signature

Date

Appendix D: Case Report Form

VRComm Case Report Form (CRF)								
1. Site ID #: _____								
2. Study ID #: _____								
3. Today's Date	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 33%; height: 20px;"></td> <td style="width: 33%; height: 20px;"></td> <td style="width: 33%; height: 20px;"></td> </tr> <tr> <td style="font-size: 8px;">dd</td> <td style="font-size: 8px;">mm</td> <td style="font-size: 8px;">yyyy</td> </tr> </table>					dd	mm	yyyy
dd	mm	yyyy						
4. Primary indication for VR: <input type="checkbox"/> Stroke <input type="checkbox"/> cardiac								
5. Patient Ineligible for Study: <input type="checkbox"/> Yes (if yes, specify below) <input type="checkbox"/> No								
<div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Does not speak/read English proficiently <input type="checkbox"/> Patient less than 18 years of age <input type="checkbox"/> Enrolled in other studies <input type="checkbox"/> Other, please specify: _____ </div> <div style="width: 20px;"></div> </div>								
<u>For intervention phase of study:</u> <input type="checkbox"/> Healthcare provider did not utilize referral tools because patient has valid contraindication to CR (specify) _____ <input type="checkbox"/> Being discharged to long-term care <input type="checkbox"/> Patient does not have cardiovascular diagnosis or procedure (e.g., angiogram results negative)								
6. Patient Declined to Participate: <input type="checkbox"/> No <input type="checkbox"/> Yes -Reason, if willing: _____								
Stop here if patient is ineligible or declined.								
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px; vertical-align: top;"> CRF Completed By: _____ Date: _____ </td> <td style="width: 50%; padding: 5px; vertical-align: top;"> CRF Entered By: _____ Date: _____ </td> </tr> </table>			CRF Completed By: _____ Date: _____	CRF Entered By: _____ Date: _____				
CRF Completed By: _____ Date: _____	CRF Entered By: _____ Date: _____							

VRComm Case Report Form (CRF)

ID #: _____

1. Index Cardiovascular Condition and/or Procedure:

☐ PCI Date: _____

Procedure: _____ Vessel(s): _____

<input type="checkbox"/> bare metal stent	<input type="checkbox"/> LM
<input type="checkbox"/> drug-eluting	<input type="checkbox"/> RCA
<input type="checkbox"/> angioplasty	<input type="checkbox"/> LAD
	(circle: prox / med / dist)
	<input type="checkbox"/> Circ
	<input type="checkbox"/> Ramus

☐ CABG Date: _____

Vessel(s): _____

<input type="checkbox"/> LM
<input type="checkbox"/> RCA
<input type="checkbox"/> LAD (circle: prox / med / dist)
<input type="checkbox"/> Circ
<input type="checkbox"/> Ramus

☐ Non-Disabling Stroke Date: _____

<input type="checkbox"/> Ischemic
<input type="checkbox"/> Hemorrhagic
<input type="checkbox"/> Transient Ischemic Attack (TIA)

☐ MI Date: _____

Location(s): _____

Type: _____

<input type="checkbox"/> Anterior	<input type="checkbox"/> STEMI
<input type="checkbox"/> Inferior	<input type="checkbox"/> NSTEMI
<input type="checkbox"/> Lateral	<input type="checkbox"/> Q-Wave
<input type="checkbox"/> Posterior	<input type="checkbox"/> BBB
<input type="checkbox"/> Septal	<input type="checkbox"/> NON-Q-Wave
<input type="checkbox"/> Rt Ventricular	<input type="checkbox"/> Unstable Angina

☐ ACS/CAD Confirmation Date: _____☐ ECG ☐ Angiogram ☐ Enzymes ☐ Symptoms☐ Other cardiovascular cond(s) Date: _____

<input type="checkbox"/> Aneurysm	<input type="checkbox"/> Arrhythmia
<input type="checkbox"/> Infection	<input type="checkbox"/> Congenital HD
<input type="checkbox"/> Heart Failure	<input type="checkbox"/> Cardiomyopathy
	<input type="checkbox"/> Other: _____

2. Scheduled or urgent admission? ☐ scheduled ☐ urgent ☐ unknown

3. Functional Status:

a. CCS Angina Class:

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4

→ ☐ IV-a ☐ IV-b ☐ IV-c ☐ IV-d

b. NYHA Functional Class:

☐ 1 ☐ 2 ☐ 3 ☐ 4

c. LV Function:

☐ Nuclear ☐ Echo ☐ Angiogram

☐ LVEF %: _____

☐ Narrative: _____

☐ Normal ☐ Mild ☐ Moderate ☐ Severe

4. Previous cardiovascular diagnosis / history:

<input type="checkbox"/> CAD	<input type="checkbox"/> Infection
<input type="checkbox"/> CHF	<input type="checkbox"/> Valve condition
<input type="checkbox"/> Arrhythmia	<input type="checkbox"/> Cardiomyopathy
<input type="checkbox"/> Congenital HD	<input type="checkbox"/> Other: _____
<input type="checkbox"/> ACS/MI	<input type="checkbox"/> None
<input type="checkbox"/> Transient Ischemic Attack (TIA)	
<input type="checkbox"/> Stroke:	
<input type="checkbox"/> Ischemic Stroke	
<input type="checkbox"/> Hemorrhagic Stroke	

5. Risk Factors:

Y N

☐ ☐ Diabetes: ☐ Type I ☐ Type II

HbA1c%: _____

Date assessed: _____

☐ ☐ Obesity (BMI > 30)

BMI (kg/m²): _____

Waist circ (cm): _____

Date assessed: _____

☐ ☐ Hypertension

BP: syst: _____ / diast: _____

Date assessed: _____

☐ ☐ Dyslipidemia

Total Cholesterol: _____

HDL: _____

LDL: _____

Triglycerides: _____

Date assessed: _____

7. Comorbidities:

<input type="checkbox"/> Cancer
<input type="checkbox"/> Hyperthyroid
<input type="checkbox"/> Liver Disease
<input type="checkbox"/> PAD/PVD
<input type="checkbox"/> Depression
<input type="checkbox"/> Renal Disease
<input type="checkbox"/> MSK / Joint Replacement, specify: _____
<input type="checkbox"/> Other: _____
<input type="checkbox"/> None

VRComm (Case Report Form) (CRF)

SEPARATE THIS SHEET

Site & Study ID#: _____

1. Patient's First Name:

2. Patient's Last Name:

3. Preferred Salutation:

- ☐
- Mr.
-
- ☐
- Ms.
-
- ☐
- Mrs.
-
- ☐
- Dr.

4. Patient would like post-study results email?
- ☐
- No
- ☐
- If yes, specify email address below:

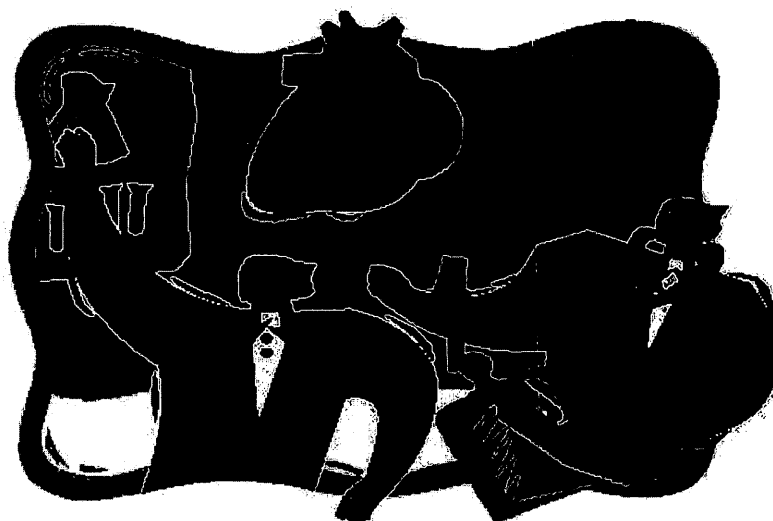
Patient's email address: _____

5. Patient medical record number (to ascertain CR referral and enrolment):

--	--	--	--	--	--	--

Appendix E: Patient Self- report Survey

Vascular Patient- Provider Interaction Study



Instructions for completing the survey questions appear at the beginning of each section.

Please seal your completed questionnaire in the envelope provided, and return it to the study coordinator.

SECTION A: ABOUT YOU

1. Are you male or female?
☐ Male ☐ Female
2. What year were you born? 19
3. What do you consider to be your racial/ethnic background? Please check ☒ one (1) of the following boxes:
 - ☐ Aboriginal (includes Inuit, Métis peoples of Canada, First Nations – North American Indian)
 - ☐ Arab (includes Egyptian, Kuwait, Libyan)
 - ☐ West Asian (includes Afghan, Assyrian and Iranian)
 - ☐ Black (includes African, Nigerian, Somali)
 - ☐ Chinese
 - ☐ Filipino
 - ☐ Japanese
 - ☐ Korean
 - ☐ Latin American (includes Chilean, Costa Rican, Mexican)
 - ☐ South Asian (includes Bangladeshi, Punjabi, Sri Lankan)
 - ☐ South East Asian (includes Vietnamese, Cambodian, Malaysian, Laotian)
 - ☐ White (Caucasian)
 - ☐ Other (specify: _____)
 - ☐ Multiple cultural backgrounds (specify: _____)
4. Who do you live with?
 - ☐ Family (spouse, children, etc.)
 - ☐ Alone
 - ☐ Other (specify: _____)
5. Do you live with someone who requires caregiving (e.g., ill spouse, grandchildren)?
 - ☐ Yes
 - ☐ No
6. Which option best matches your work status?
 - ☐ Employed Full-time (that is 35 or more hours per week)
 - ☐ Employed Part-time (that is less than 35 hours per week)
 - ☐ Self-employed (primary occupation)
 - ☐ Unemployed, but looking for work
 - ☐ Student
 - ☐ Retired
 - ☐ Not in the paid workforce (homemaker, unemployed, not looking for work)

Participant # _____

7. What is your marital status:

- ☐ Single
☐ Married or equivalent (i.e., common law, same sex)
☐ Separated or equivalent
☐ Widowed

8. What is the highest level of education you have completed?

- ☐ Less than high school (no certificates, diplomas or degrees)
☐ High school graduation certificate
☐ Trades certificate
☐ College certificate or diploma: a certificate from a community college, CEGEP, school of nursing, theological college or private college
☐ University: a certificate below the bachelor's level, bachelor's degree, certificate above the bachelor level, master's degree, earned doctorate or a professional degree in medicine, dentistry, veterinary medicine or optometry

9. Please circle one number in each row below.

10. Over the past 2 weeks, how often have you been bothered by any of the following problems?	Not At All	Several Days	More Than Half the Days	Nearly Every Day
a. Little interest or pleasure in doing things	0	1	2	3
b. Feeling down, depressed or hopeless	0	1	2	3

Participant # _____

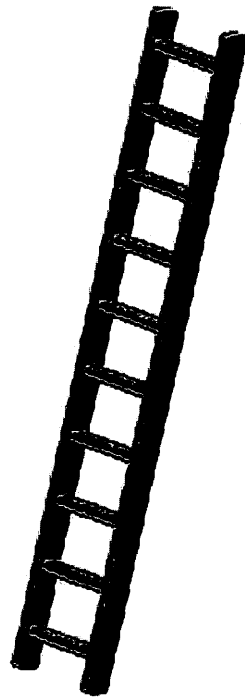
11. Social Economic Status

Think of the ladder below as representing where people stand in Canada.

At the top of the ladder are the people who are the best off – those who have the most money, the most education, and the most respected jobs. At the bottom are the people who are the worst off – who have the least money, least education, and the least respected jobs or no job. The higher up you are on this ladder, the closer you are to the people at the very top; the lower you are, the closer you are to the people at the very bottom.

Where would you place yourself on this ladder?

Please place a large "X" on the rung where you think you stand at this time in your life, relative to other people in Canada.



SECTION B: ABOUT YOUR HEALTH

1. What is your current height? _____ feet and _____ inches or (_____ cm)
2. What is your current weight? _____ pounds or (_____ kgs)
3. Please describe your smoking status:
 - ☐ I have never smoked (no history of any form of tobacco)
 - ☐ I currently smoke (use of any form of tobacco in the last month)
 - How many cigarettes per day on average? _____ cigarettes per day
 - For how many years have you smoked? _____ years
 - ☐ Former smoker (use of tobacco more than one month ago)
 - When did you quit? Month _____ year _____
 - How many cigarettes per day did you smoke on average? _____ cigarettes per day
 - For how many years did you smoke? _____ years
4. Do you have a history of early vascular disease in your family (i.e., direct blood relatives – male diagnosed before 55 years old or female diagnosed before 65 years old)?
 - ☐ Yes
 - ☐ No
5. Do you have high cholesterol, or take cholesterol-lowering medication?
 - ☐ Yes
 - ☐ No
6. Do you have high blood pressure, or take blood pressure medication?
 - ☐ Yes
 - ☐ No
7. Did you exercise to the point of getting short of breath on a regular basis (as an adult) prior to your vascular event?
 - ☐ Yes
 - ☐ No
8. Did a doctor tell you that you were diagnosed with heart disease or stroke before this hospitalization?
 - ☐ Yes, please specify: _____
 - ☐ No

If yes, approximately when were you diagnosed? _____ / _____
(Month) (Year)

Participant # _____

SECTION C: USUAL ACTIVITIES

Instructions: The following questions have to do with your current activity status.

Please circle **Yes** or **No** in response to each question.

1.	Can you take care of yourself, that is, eating, dressing, bathing or using the toilet?	Yes	No
2.	Can you walk indoors, such as around your house?	Yes	No
3.	Can you walk a block or two on level ground?	Yes	No
4.	Can you climb a flight of stairs or walk up a hill?	Yes	No
5.	Can you run a short distance?	Yes	No
6.	Can you do light work around the house like dusting or washing dishes?	Yes	No
7.	Can you do moderate work around the house like vacuuming, sweeping floors, or carrying in the groceries?	Yes	No
8.	Can you do heavy work around the house like scrubbing floors, or lifting or moving heavy furniture?	Yes	No
9.	Can you do yard work like raking leaves, weeding or pushing a power mower?	Yes	No
10.	Can you have sexual relations?	Yes	No
11.	Can you participate in moderate recreational activities like golf, bowling, dancing, doubles tennis, or throwing a baseball or football?	Yes	No
12.	Can you participate in strenuous sports like swimming, singles tennis, football, basketball or skiing?	Yes	No

Participant # _____

SECTION D: OTHER HEALTH PROBLEMS

Instructions: Please check ☒ whether or not you experience the following health problems:

Health Problem	Have it?
a. Joint repair or replacement (such as hips, knees)	YES <input type="checkbox"/> NO <input type="checkbox"/>
b. Arthritis	YES <input type="checkbox"/> NO <input type="checkbox"/>
c. Osteoporosis	YES <input type="checkbox"/> NO <input type="checkbox"/>
d. Prior transplant (for example heart, lung, kidney)	YES <input type="checkbox"/> NO <input type="checkbox"/>
e. Chronic Obstructive Pulmonary Disease (COPD)	YES <input type="checkbox"/> NO <input type="checkbox"/>
f. Diabetes Type 1 or 2? : _____	YES <input type="checkbox"/> NO <input type="checkbox"/>
g. Chronic Renal Failure (liver), dialysis	YES <input type="checkbox"/> NO <input type="checkbox"/>
h. Peripheral arterial disease (for example claudication, aortic aneurysm, amputation)	YES <input type="checkbox"/> NO <input type="checkbox"/>
i. Cancer (such as breast, lung, cervix, stomach, colon, kidney, bone, metastasis or spread, lymphoma, leukemia, others)	YES <input type="checkbox"/> NO <input type="checkbox"/>
j. Other health problems, please specify: _____	YES <input type="checkbox"/> NO <input type="checkbox"/>

Participant # _____

SECTION E: YOUR HEALTH CARE EXPERIENCE

1. Managing a chronic illness can be challenging. For each item, select the number that best indicates your experience during your recent audiotaped interaction with a healthcare provider or peer volunteer.

	Not at all	1	2	A moderate amount	3	A great deal	4	5
To what extent:		1	2		3		4	5
a. Did your healthcare provider involve you as an equal partner in making decisions about illness management strategies and goals?		<input type="checkbox"/> 1	<input type="checkbox"/> 2		<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
b. Did your health care provider listen carefully to what you had to say about your illness?		<input type="checkbox"/> 1	<input type="checkbox"/> 2		<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
c. Did your health care provider encourage you to go to a specific group or class to help you manage your health condition?		<input type="checkbox"/> 1	<input type="checkbox"/> 2		<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
d. Did your healthcare provider convey that what you do to take care of yourself influences your health condition?		<input type="checkbox"/> 1	<input type="checkbox"/> 2		<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5

2. Think again about the recent interaction you had with a healthcare provider which was recorded for the study. On the scale below from 1-5 (1 being poor and 5 being excellent), rate your perception of the patient-centeredness of the interaction by circling one number.

Poor					Excellent
1	2	3	4	5	

3. Was anyone else in your room when your interaction with a healthcare provider or peer volunteer was audio recorded?

- ☐ No
- ☐ Yes – if yes, who (please check all that apply)?
- ☐ Spouse/partner
 - ☐ Child
 - ☐ Other family member
 - ☐ Friend
 - ☐ Other (please specify who: _____)

Participant # _____

SECTION F: VASCULAR REHABILITATION

Cardiovascular rehabilitation is an outpatient program of structured exercise and education to maximize your recovery. For example, you might go to a hospital program to exercise 1-2 times per week for 4 months or so.

(f) Previous Experience With Cardiovascular Rehabilitation

(a) Before this hospitalization, had you ever heard of Cardiovascular Rehabilitation?

- ☐ Yes
- ☐ No (skip to next section)

(b) IF YES: Before this hospitalization, had you ever been referred to a Cardiovascular Rehabilitation program?

- ☐ Yes
- ☐ No (skip to next section)
- ☐ I do not remember

(c) IF YES: Have you ever enrolled in a Cardiovascular Rehabilitation program (i.e. attended an intake/orientation session)?

- ☐ Yes
- ☐ No (skip to next section)

(d) IF YES: Have you ever participated in a cardiovascular rehabilitation program?

- ☐ Yes
- ☐ No
- ☐ Not applicable. I was never referred to a program

(e) IF YES: What year did you participate in cardiovascular rehabilitation: _____

Participant # _____

(II) Current Experience With Cardiovascular Rehabilitation

(a) Today, I would rate my knowledge and awareness of Cardiovascular Rehabilitation as:

Very Limited	Somewhat Limited	Good	Somewhat informed or knowledgea ble	Very Informed
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(b) During this current hospital stay or clinic visit, did anyone discuss Cardiovascular Rehabilitation with you?

- ☐ Yes
☐ No (skip to the last question)
☐ I do not remember (skip to the last question)

(c) IF YES: Who discussed Cardiovascular Rehabilitation with you during your recent encounters with healthcare? Please ✓ all that apply:

- ☐ My cardiovascular surgeon, cardiologist or other medical specialist
☐ Nurse-Practitioner
☐ Nurse
☐ Dietitian
☐ Physiotherapist
☐ Researcher
☐ Peer Volunteer
☐ Other: _____

(d) IF YES: How strongly did your health care provider endorse Cardiovascular Rehabilitation (check one box below)?

Not at all strongly	Somewhat strongly	Neutral	Strongly	Very Strongly
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(e) IF YES, is a healthcare provider referring you to cardiovascular rehab?

- ☐ Yes
☐ No

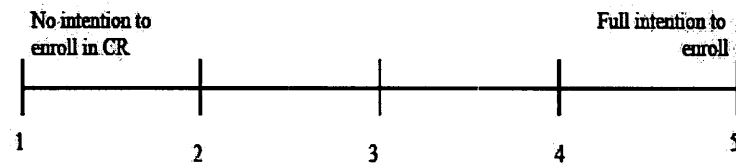
Participant #

(f) IF YES, was the discussion about cardiovascular rehabilitation audiotaped?

☐ Yes

☐ No

(g) After you are discharged from the hospital, do you intend to enroll in a Cardiovascular Rehabilitation program? Please rate your degree of intention to go to cardiovascular rehab on the 5 point scale below (circle one number between 1 and 5)



Participant #

Thank you for taking the time to complete this survey. Your assistance in providing this information is very much appreciated. If there is anything else you would like to tell us about this survey, or about your experiences with cardiovascular disease and/or recovery, please do so in the space provided below:

Please return your completed questionnaire in the envelope provided to the study coordinator personally, OR mail it in the stamped envelope to:

Vascular Patient-Provider Interaction Study Coordinator
EN7-233
Toronto General Hospital
200 Elizabeth Street
Toronto, ON
M5G 2C4

Appendix F: Tool: CR Program Pamphlet

Interpretation Services

If you feel more comfortable communicating in a language other than English we can arrange for an interpreter to help us communicate better.

Resources

You can find our Education Binder at:

www.uhn.on.ca

Go to Clinics & Services



Toronto Western Hospital
(see link in text)



Cardiac Care and Heart Health



Binder name is
"Take Your Health to Heart"
(also available in Portuguese)

Toronto Western Hospital
Cardiac Care and Heart Health
PMCC Cardiovascular Rehabilitation
and Prevention

399 Bathurst St.
7th Fl - Room 108
South Elevators

Phone: (416) 603-5200

Fax: (416) 603-5373

About The Peter Munk Cardiac Centre
For more information about heart and circulation conditions, a glossary of terms, maps, information about our location and how to be referred, please visit www.petermunkcardiaccentre.ca



PMCC Cardiovascular
Rehabilitation and
Prevention Program



Cardiac Rehabilitation (CR) is "the enhancement and maintenance of cardiovascular health through individualized programs designed to optimize physical, psychological, social, vocational, and emotional status."

Patient Education
Improving health through education

Please visit the UHN Patient Education website for more health information:
www.uhnpatienteducation.ca
© 2011 University Health Network. All rights reserved.
This information is to be used for informational purposes only and is not intended as a substitute for professional medical advice, diagnosis or treatment.
Please consult your health care provider for advice about a specific medical condition. A single copy of these materials may be reprinted for non-commercial personal use only.

Author: Cardiac Rehabilitation Staff
Created: 06/2011
Form: D-6732

12248



University Health Network
Toronto's Health System

Our Program

- A patient and family focused cardiac outpatient clinic
- Home based exercise program offered
- No fees charged
- We will teach you and your family about your heart condition and help you to:
 - live a healthy life
 - quit smoking
 - exercise regularly
 - eat healthy
 - manage stress in your life

Who can benefit from the program?

Our program will help all patients with heart conditions.

The healthcare team in the clinic will work with your doctor to help manage your heart condition.

What does the Program involve?

First Visit (Education Class)

Your first visit is for an Education Class where you will learn more about your heart condition.

You may be triaged into our supervised or home exercise program.

Second Visit (Intake Assessment)

- You will be seen individually.
- You will be asked to do an exercise treadmill test at this visit to help us prescribe a safe level of exercise for you.

Supervised Cardiac Rehabilitation Exercise Classes

- The program consists of a total of 32 exercise sessions about 90 minutes in duration each session.
- Classes are offered in the morning and afternoon.
- You will need to attend at least 2 exercise classes a week.

OR

Home Exercise

- You will be seen individually then follow an exercise program at home with regular telephone follow up.
- You will be asked to attend one education class (2 hours in duration) once a month for four months.

Graduation

At the end of the program you will have another treadmill test to review your progress and you will receive a certificate of completion.

If there is another cardiac rehabilitation program you would prefer to attend, please let the staff know.

Our Healthcare Team

Our healthcare team will work with you to help make sure your heart works the best it can.

- clinical dietitian
- registered nurse
- kinesiologist
- exercise physiologist
- pharmacist
- doctor

Our healthcare team will also work very closely with other care providers to manage your diabetes and help you quit smoking.

**"The journey of a thousand miles
begins with a single step"**

Components of the Cardiovascular Rehabilitation Services

As part of the six month treatment plan, patients are encouraged to participate in the following:

Orientation Sessions

An introduction to the services provided by an Exercise Therapist, Registered Nurse and Dietitian.

Introductory/Exit Assessments

Introductory and exit assessments are conducted to evaluate risk factors and create a personal care plan to assist in lifestyle behaviour changes.

Educational Lectures

Lectures are offered on topics such as stress management, relaxation and heart healthy eating. A clinician at the center will assist you in selecting the sessions that will be most valuable for your needs.

For More Information

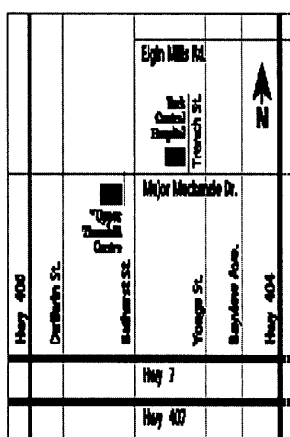
If you have any questions about the services offered through the York Central Hospital Cardiovascular Rehabilitation Service or wonder if this service may be appropriate for you or those around you, feel free to contact us Monday to Friday at 905-883-8070 ext. 2232 or by email: cardiacrehab@yorkcentral.on.ca

We also invite you to browse through the Cardiovascular Rehabilitation Service area on the York Central hospital website at www.yorkcentral.on.ca

How to Find the Health and Wellness Centre

York Central Hospital's Health and Wellness Centre, including Cardiovascular Rehabilitation and Chronic Disease Management Services are available at the Upper Thornhill Centre site:

955 Major Mackenzie Drive
Vaughan, ON, L6A 4P9
905-832-8070 ext. 2232



**Health and
Wellness Centre**
Cardiovascular Rehabilitation Service
and Chronic Disease Management



Creating to make a difference

York Central Hospital
10 Trench Street, Richmond Hill,
Ontario Canada L4C 4Z3
t 905-883-1212
f 905-883-2455
www.yorkcentral.on.ca

(093 - 201) 1/09

Creating Overall Cardiovascular Wellness and Chronic Disease Management

York Central Hospital's Cardiovascular Rehabilitation Service promotes overall cardiovascular wellness in patients with documented cardiovascular disease as well as those at risk for developing cardiovascular related conditions. Our mandate is to empower patients with knowledge necessary to make the appropriate decisions in creating a healthier lifestyle. This service is available at York Central Hospital's Upper Thornhill Centre Site located at 955 Major Mackenzie Drive West.

Exercise Sessions

Once your personalized exercise program has been completed, participants can attend these supervised sessions twice per week for 1 to 1.5 hours in length. Sessions are offered during the day and in the evening. Classes include multi-stage workouts, stretching and strengthening exercises, aerobic classes and aerobic circuit training using treadmills, walking, cycling and rowing. Blood pressure and heart rates are monitored throughout the class. Persons with diabetes will monitor their blood sugar levels before and after exercise class.

Nutrition and Medication Counseling

Individual and group counseling sessions are available to provide guidance and support in making the necessary lifestyle changes to enhance your rehabilitation program.

Stress Testing

Physician supervised, graded exercise tests are provided at regular intervals when participating in the program.

Health Benefits

The following are health benefits that patients may experience as a result of participating in our services:

- Improvement in cardiovascular fitness
- Weight loss
- Overall increased feeling of well being
- Improved resting blood pressure levels
- Improved blood sugar control
- Improved cholesterol
- Improved triglyceride levels

How to get involved in the Cardiovascular Rehabilitation Service

Those interested in receiving services at York Central Hospital's Cardiovascular Rehabilitation Service must have the following:

- A referral from a family physician, cardiologist, internist or neurologist
- Recent cholesterol results
- A recent (within 6 months) stress test

Program staff can assist you in arranging a referral and/or tests.

Who can benefit from this Service?

Clients with the following conditions:

- Documented cardiovascular disease including those who have had a heart attack, angioplasty, bypass surgery, valve replacements or repair, TIA, High Functioning Stroke

- Angina
- Congestive heart failure
- Those who have had a heart transplant or are currently awaiting a transplant

Clients with the following risk factors may benefit from our services including those:

- With high cholesterol
- With high blood pressure
- Who are obese
- Who smoke
- With diabetes
- With increased stress levels and inactive lifestyles

The Team Approach

Cardiovascular Rehab services are offered by a healthcare team which includes the following:

- Cardiologist
- Family physicians, internists, neurologists
- Registered Nurses
- Kinesiologists
- Exercise physiologists
- Physiotherapists
- Registered Dietitians
- Pharmacists
- Social Workers

Appendix G: Tool: Patient Motivational Letters (Cardiac and Stroke)

Cardiovascular Rehabilitation and Prevention Program, Peter Munk Cardiac Centre, University Health Network
7th Floor Fell/East, Room 108; Toronto Western Hospital
399 Bathurst Street, Toronto, ON M5T 2S8
Telephone: (416) 603-5200

Dear Patient:

Like other patients who have been hospitalized for a heart problem, you will soon be offered a place in our Cardiovascular Rehabilitation and Prevention Program (please see the attached pamphlet for more details). Medical and nursing associations recommend that people who have been hospitalized for a heart problem such as yours should attend a cardiac rehabilitation program.

When your healthcare provider sends a referral to us at the cardiac rehabilitation program, we will:

1. give you a call at home to answer any questions you may have
2. arrange a time for your first visit
3. provide information about where we are located
4. refer you to services closer to your home for those who live outside Toronto

We will offer advice and information at the Education Class about how you can recover. It will be up to you to follow these recommendations. Experience has shown that the more effort you can put in, the more quickly you will see results because those who attend cardiac rehabilitation programs are able to recover sooner and better than those who do not. Also, research has shown that you can lower your chance of dying from another heart problem if you attend a program.

We are aware that some people have doubts or concerns about attending. Please rest assured that your first appointment is an Education Class which helps you better understand about your heart problems. We will use this time with you to review your current health, and the problems you may have attending the following exercise classes.

Our aim through the cardiac rehabilitation program is to help you:

- improve your future health
- prevent further heart problems
- reduce your symptoms

We will be sure to inform your other healthcare providers that you came for an Education Class and to share your results with them. If you have any questions about cardiac rehabilitation, you can ask your healthcare providers, or you can call us at the number at the top of the page.

With best wishes for your recovery,



Dr. Caroline Chessex, MD
Clinical Director, Cardiovascular Rehabilitation & Prevention Program
Peter Munk Cardiac Centre, Toronto Western Hospital, University Health Network



Peter Munk Cardiac Centre
Toronto Western Hospital

York Central Hospital
12 Finch Street
Richmond Hill, ON
Canada L4C 4Z3

Phone: 905 883 1212
Fax: 905 883 2055
www.yorkcentral.on.ca



York Central Hospital Vascular Rehabilitation Program
Upper Thornhill Centre
955 Major Mackenzie Drive, Vaughan, Ontario, L6A 4P9
Tel: (905) 832-8070 ext. 2232
cardiac_rehab@yorkcentral.on.ca

Dear Patient:

Like other patients who have been hospitalized for a minor stroke, you will soon be offered a place in our Cardiovascular Rehabilitation and Prevention Program (please see the attached pamphlet for more details).

When your healthcare provider sends a referral to us at the cardiovascular rehabilitation program, we will:

1. give you a call at home to answer any questions you may have
2. arrange a time for your first visit
3. provide information about where we are located

We will offer advice and information at the Education Class about how you can recover. It will be up to you to follow these recommendations. Experience has shown that the more effort you can put in, the more quickly you will see results because those who attend cardiovascular rehabilitation programs are able to recover sooner and better than those who do not.

We are aware that some people have doubts or concerns about attending. Please rest assured that your first appointment is an Education Class which helps you better understand about your health problems. We will use this time with you to review your current health, and the problems you may have attending the following exercise classes.

Our aim through the cardiovascular rehabilitation program is to help you:

- improve your future health
- prevent further health problems
- reduce your symptoms

We will be sure to inform your other healthcare providers that you came for an Education Class and to share your results with them. If you have any questions about cardiovascular rehabilitation, you can ask your healthcare providers, or you can call us at the number at the top of the page.

With best wishes for your recovery,

Tiziana Rivera, RN MSc GNC(C)
Chief Practice Officer
Professional Practice

Appendix H: Tool: Telephone Script



Hello. Is (Patient's Full Name) there?

If yes: My name is (Peer Mentor's Name) and I am phoning from the (Program Name and Location). We received your referral to our program from (Referring Individual's Name Here). Do you remember being referred to our program?

Okay, well our program is here to support you in improving your vascular health. We offer education on your condition and medications, diet and exercise. You will have the chance to meet other patients who have gone through the same experience as you when you come in for our sessions in the gym.

Patients who come to rehab programs, including our program, really appreciate having their questions answered, feeling more energy and confidence. Patients who come have lower chances of going back to the hospital for repeat health problems too. That is why you were referred to us. Do you have any questions?

If patients raise transportation barriers: talk about public transit, Mobility, CHATs etc
If patients raise other barriers: problem solve and consider way to overcome them as much as possible (i.e., your health is very important, and your doctor referred you because it will help your heart).

If patients raise medical issues: tell patient your qualifications and that they would need to see their doctor to get those questions answer as you cannot provide medical advice.

I believe (Name of Administrative Assistant) the appointment secretary was going to call you to schedule you in for an education / orientation class and an intake appointment. Have you got your appointment booked?

If no: Okay well I will get in touch with (Name of Administrative Assistant) to make sure he/she gives you a call in the next day or so.

If yes: Wonderful. I am sure you will find it really helpful. You are welcome to bring along a family member if there is someone who would want to come along.

Do you know how to get to us? *If no:* We are located at (Location and Time of Visit) Okay – before you go let me just tell you a bit about what to expect at your initial visit. You can meet some members of our team to talk about your health one-on-one.

We are looking forward to seeing you on (Day). I will give you my name and number in case you need to call back with any questions. Do you have a pen and paper handy? My name is (Peer Mentor's Name and Contact Number).

Appendix I: Tool: Patient Discharge Contract



Peter Munk Cardiac Centre
University Health Network

PATIENT PRE-DISCHARGE CONTRACT: CARDIAC REHABILITATION

Medical guidelines recommend that people who have been hospitalized for a heart problem such as yours should attend cardiac rehabilitation. Attending will help ensure the best possible recovery for you.

1. I understand that it is important to attend a Cardiac Rehabilitation program. By attending this program, I can:
 - Get answers to questions that I and my family have about my recovery and health
 - Reduce my symptoms
 - Increase my energy and vitality
 - Prevent further heart problems

☐ Yes, I understand the benefits of a Cardiac Rehabilitation program
2. My healthcare provider has reviewed what cardiac rehabilitation programs offer, and what the benefits are for me:

☐ Yes
3. My healthcare provider discussed any concerns I may have about attending cardiac rehabilitation:

☐ Yes
4. My healthcare provider has referred me to a Cardiac Rehabilitation program:

☐ Yes ☐ No (why not? _____)
5. I know that the cardiac rehab program has an education class every Thursday from 9 until 3 at the Toronto Western Hospital, east elevators, 8th floor, Room 481 where I can learn about how to manage my heart problem. The specialist team will be on hand to give me advice and information to help me make informed choices about my rehabilitation:

☐ Yes
6. If I don't live close to the cardiac rehabilitation program here, I know Lucy at the cardiac rehab program will be calling me to refer me to a program closer to my home in the next week.
7. If I don't hear from Lucy to book me in within the next 7 days or if I have any questions, I will not hesitate to call her at (416) 603-5200:

☐ Yes

Patient Signature	Date
Healthcare Provider Signature	Date

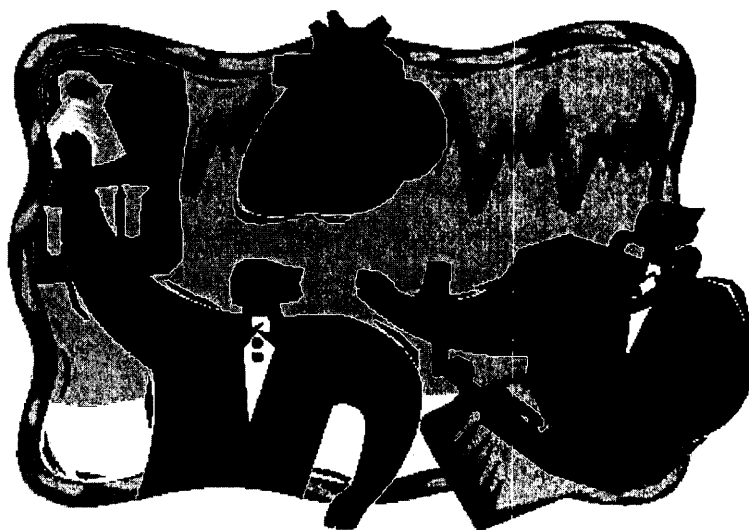
For more information on Cardiac Rehabilitation, please visit:
<http://www.nlm.nih.gov/medlineplus/tutorials/cardiarehabilitation/htm/index.htm>

For information on the UHN Cardiovascular Rehabilitation & Prevention Program, please visit:
http://www.uhn.ca/Focus_of_Care/Munk_Cardiac/clinics/cardiac_care.asp

For information on the other cardiac rehab programs, please visit:
http://www.cacr.ca/information_for_public/directory.cfm

Appendix J: Healthcare Provider Self-report Survey

Vascular Patient- Provider Interaction Study



Instructions for completing the survey questions appear at the beginning of each section.

Please seal your completed questionnaire in the envelope provided, and return it to the study coordinator.

VRComm STUDY SURVEY: VASCULAR PATIENT-PROVIDER INTERACTIONS

1. What is your profession?
 - ☐ Physician – specify specialty: _____
 - ☐ Nurse-practitioner
 - ☐ Nurse
 - ☐ Allied health professional, please specify: _____
 - ☐ Peer mentor
 - ☐ Other: _____

2. What is the highest level of education you have completed?
 - ☐ Medical Degree
 - ☐ Graduate Degree
 - ☐ Undergraduate degree
 - ☐ College Diploma
 - ☐ Other: _____

3. What year did you obtain your highest academic qualification? _____

4. What is your sex? Please circle: *Male* *Female*

5. What is the average number of patients you see daily? _____

6. Please indicate your level of awareness of cardiovascular rehabilitation (circle one word):

Excellent Very Good Good Satisfactory Poor

7. What percentage of your eligible patients do you refer (MDs / NPs) to, or recommend (allied health) cardiovascular rehab?

_____ %

8. Please rate your perceptions of the quality of the interaction with the cardiovascular patient during your recent audiotaped interaction (circle one word):

Excellent Very Good Good Satisfactory Poor

9. Will the patient with whom you interacted be referred to cardiovascular rehabilitation?
 - ☐ Yes
 - ☐ No, specify reason: _____
 - ☐ I don't know

PEER MENTORS: STOP HERE

Appendix K: CR Specific Coding Guide

Page 1 of 1

Patient ID: _____

Provider ID: _____

Recording ID: _____

VRComm Study – Patient-Provider Audiorecording Scoring Sheet

Score the following elements of the patient-provider discussion (as per the study protocol) by circling the option in bold:

(1) Was CR mentioned at any point during the patient-provider discussion?

YES **NO**

(2) IF YES: Who first talked about CR?

Provider **Patient** **Family member**

(3) Was the exchange a 2-way discussion (i.e., did both the patient and provider talk about CR)?

YES **NO**

(4) IF NO: Who was the person who talked about CR?

Provider **Patient** **Family member**

(5) Was a referral to CR discussed?

YES **NO**

(6) Did the provider endorse/encourage patient participation in CR?

YES **NO**

(7) Were barriers to CR mentioned?

YES **NO**

(8) IF YES: were solutions discussed?

YES **NO**

(9) IF YES: specify what specific solutions were discussed (i.e. geographically-convenient program locations, program schedules accommodate evening classes for patients returning to work, program offers home-based services for patients with transportation barriers, programs tailor exercise prescriptions taking into consideration patient mobility problems, etc)?

SPECIFY _____

VRComm Patient Provider Scoring Sheet

Sept 14 2011

VI

Date & Initials of Scorer: _____

Date & Initials of Coder: _____

Appendix L: Survey Specific to Inpatient-Healthcare Provider Interactions

VRComm STUDY: HEART INPATIENT-PROVIDER INTERACTIONS

Provider ID _____
 Patient ID _____

1. Please rate your perceptions of the quality of the interaction with the cardiac patient during your recent audiotaped interaction (circle one word):

Excellent Very Good Good Satisfactory Poor

2. Will the patient with whom you interacted be referred to cardiac rehabilitation?

☐ Yes
☐ No
☐ I don't know

3. Please circle which cardiac rehabilitation tool was used, if any:

Motivational letter and pamphlet Discharge Contract Telephone Script

4. If you used a discharge contact, did the patient sign it?

YES NO

Thank you for taking the time to complete this questionnaire.
 Please return your completed questionnaire in the envelope provided to the study coordinator OR:
 EN7-233, Toronto General Hospital
 200 Elizabeth St. Toronto, ON M5G 2C4

Appendix M: RIAS Coding Guide

RIASCAT.DOC/RIAS VARIABLES UHN STUDY

ALL DOCTOR TALK (ALL PRIMARY AND 2ND PROVIDER) (X)/PRIMARY DOCTOR TALK
(D)/2ND PROVIDER TALK (2)

PERSX/D/2	personal remarks
LAUGX/D/2	laughs, tells jokes
APPX/D/2	approval-direct
COMPX/D/2	compliment-general
DISX/D/2	disagreement, criticism-direct
CRITX/D/2	disagreement, criticism-general
EMPX/D/2	empathy statements
LEGITX/D/2	legitimation statements
CONX/D/2	concern, worry
ROX/D/2	reassures, optimism
PARTX/D/2	partnership statements
SDISX/D/2	self-disclosure
IMEDX/D/2	gives information-medical
ITHERX/D/2	gives information-therapeutic
ILSX/D/2	gives information-lifestyle
IPSX/D/2	gives information-psychosocial
IOTHX/D/2	gives information-other
AGREX/D/2	shows agreement, understanding
BCX/D/2	back-channels
CHECX/D/2	paraphrase, checks for understanding
TRANX/D/2	transitions
ORIX/D/2	gives orientation, instructions
CMEDX/D/2	closed question-medical
CTHERX/D/2	closed question-therapeutic
CLSX/D/2	closed question-lifestyle
CPSX/D/2	closed question-psychosocial
COTHX/D/2	closed question-other
OMEDX/D/2	open question-medical
OTHERX/D/2	open question-therapeutic
OLSX/D/2	open question-lifestyle
OPSX/D/2	open question-psychosocial
OOTHX/D/2	open question-other
ASKOX/D/2	asks for opinion
ASKPX/D/2	asks for permission
ASKRX/D/2	asks for reassurance
ASKUX/D/2	asks for understanding
BIDX/D/2	bid for repetition
CNLMDX/D/2	counsels-medical/therapeutic
CNLSX/D/2	counsels-lifestyle/psychosocial
UNINTX/D/2	unintelligible

RIAS VARIABLES/UHN STUDY

ALL PATIENT TALK (2)/PRIMARY PATIENT TALK (P)/3RD PARTY TALK (3)

PERSZ/P/3	personal remarks
LAUGZ/P/3	laughs, tells jokes
APPZ/P/3	approval-direct
COMPZ/P/3	compliment-general
DISZ/P/3	disagreement, criticism-direct
CRITZ/P/3	disagreement, criticism-general
EMPZ/P/3	empathy statements
LEGITZ/P/3	legitimation statements
CONZ/P/3	concern, worry
ROZ/P/3	reassures, optimism
IMEDZ/P/3	gives information-medical
ITHERZ/P/3	gives information-therapeutic
ILSZ/P/3	gives information-lifestyle
IPSZ/P/3	gives information-psychosocial
IOTHZ/P/3	gives information-other
AGREZ/P/3	shows agreement, understanding
CHECZ/P/3	paraphrase, checks for understanding
TRANZ/P/3	transitions
ORIZ/P/3	gives orientation, instructions
QMEDZ/P/3	all questions-medical
QTHERZ/P/3	all questions-therapeutic
QLSZ/P/3	all questions-lifestyle
QPSZ/P/3	all questions-psychosocial
QOTHZ/P/3	all questions-other
ASKSZ/P/3	asks for service
ASKRZ/P/3	asks for reassurance
ASKUZ/P/3	asks for understanding
BIDZ/P/3	bid for repetition
UNINTZ/P/3	unintelligible utterance

GLOBAL AFFECT RATINGS (LOW 1-5 HIGH)

PROVIDER

ANGD anger/irritation
 ANXD anxiety/nervousness
 DOMD dominance/assertiveness
 INTD interest/attentiveness
 WARM D friendliness/warmth
 ENGAGD responsiveness/engagement
 SYMD sympathetic/empathetic
 HURD hurried/rushed
 RESPTD respectfulness
 INTERD interactivity

PATIENT

ANGP anger/irritation
 ANXP anxiety/nervousness
 DEPRP depression/sadness
 DISTP emotional distress/upset
 DOMP dominance/assertiveness
 INTP interest/attentiveness
 WARM P friendliness/warmth
 ENGAGP responsiveness/engagement
 SYMP sympathetic/empathetic
 RESPTP respectfulness
 INTERP interactivity

2nd PROVIDER

ANG2 anger/irritation
 ANX2 anxiety/nervousness
 DOM2 dominance/assertiveness
 INT2 interest/attentiveness
 WARM 2 friendliness/warmth
 ENGAG2 responsiveness/engagement
 SYM2 sympathetic/empathetic
 HUR2 hurried/rushed
 RESPT2 respectfulness
 INTER2 interactivity

ADDITIONAL VARIABLES IN FILE:

TAPEID 8-digit tape ID
 CODER coder ID
 SEXD 1st provider gender 1=male 2=female
 SEX P patient gender 1=male 2=female 3=don't know
 DLEFT provider left room? 0=no 1+=yes, number of times
 SECDLEFT length of time (in seconds) dr out of room
 PHONE any phone calls? 0=no 1=yes 2=one-sided encounter; dr on
 phone with patient; only dr talk coded

OTHERDR 2nd provider present? 0=no 1=yes
 THIRD 3rd party present? 0=no 1=yes
 THIRDEXT extent of 3rd party talk 1=little 2=medium 3=high
 QUALITY tape quality
 1=good
 2=fair
 3=some inaudible sections

 BEGIN recording begins abruptly? 0=no 1=yes
 END recording ends abruptly? 0=no 1=yes 2=miss good-byes
 PAUSE recording paused? 0=no 1+=number of pauses

 SECLENG length of visit in seconds
 MINLENG length of visit in minutes

PTCENT1 = patient-centeredness score 1 (PSYQUEd + INFOPSYd + EMOD +
 PSYQUEp + PARTNERd + INFOPSYp + EMOp + MEDQUEp) / (MEDQUEd + PROCd +
 INFOMEDp + INFOMEDd)